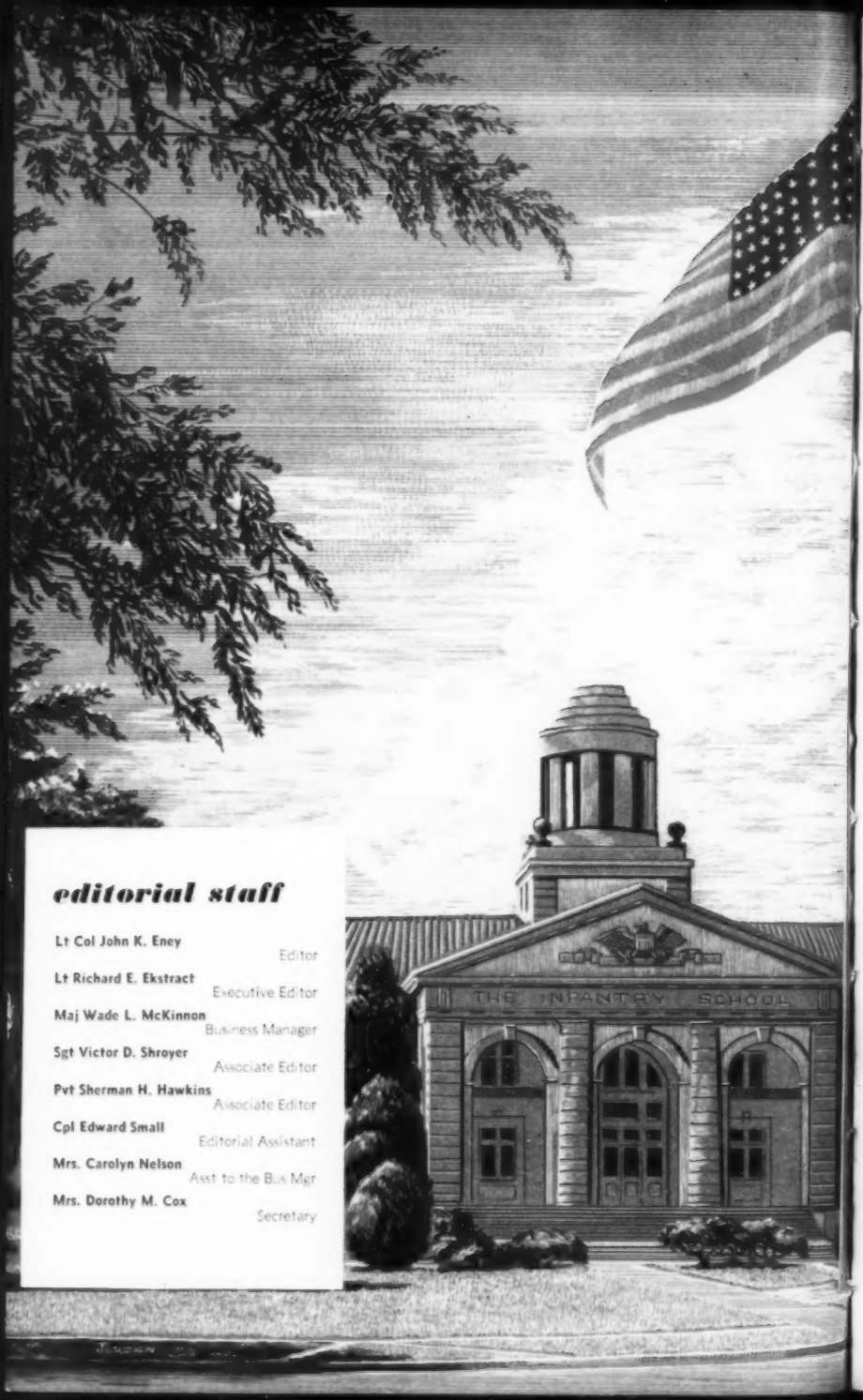
THE

Infantry

SCHOOL QUARTERLY

the magazine
for infantrymen

OCT. 1954



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volume 44 number 4 — october 1954

the infantry school

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Published quarterly by The Infantry School, Fort Benning, Ga. Entered as second-class matter June 11, 1948, at the Post Office, Columbus, Ga., under the Act of March 3, 1879. Subscription rates: 1 year, $2.50; 2 years, $4.75; 3 years, $7.00. Four copies a year. Foreign subcribers add $.25 yearly for postage. Address subscription applications to THE BOOK DEPARTMENT, THE INFANTRY SCHOOL, FORT BENNING, GA.

letters

Acknowledgement!

The excerpt from "The Stilwell Papers" found on page 97 is reprinted with permission of Mrs. Stilwell. We wish to thank Mrs. Stilwell and assure her that today's Infantrymen will benefit by the General's thoughts on the Psychology of Command.—Editor

Kudos!

Jersey City, N. J.

Sir:

. . . getting a lot of material from The Infantry Quarterly for use in connection with my new duties as M-1 instructor. Keep up the good work.

George A. Schneider, CWO

. . . Glad we could help you. Don't miss "How to Become a Distinguished Marksman," by Lt. Col. Lea . . . it's on page 10.—The Editor.

Inf./Abn. Rep. in
United Kingdom

Sir:

Now that I have been assigned to a new duty station, and particularly since my assignment involves duties as the Infantry Liaison Officer in the United Kingdom, my need for the information contained in the Quarterly is even more acute. Inclosing my check for a three year subscription.

Charles G. Shettle, Lt. Col.

Optical Allusion

Riverside, California

Sir:

I'm an avid fan of "Letters to the Editor" columns. . . . As a long time reader of The Infantry Quarterly, I'll agree that it has improved but your slips are showing! For example, on p. 68 (Scout Dogs on Patrol—July '54) I think you'll find the word "enemy" (4th line, 2nd par.) should read "dog." On p. 30 (same issue) the text for figure 1 refers to pages 4, 5 & 6 . . . shouldn't it read pages 31, 32 & 33? Did the editor misplace his bifocals?

Lt. Col. Russell S. Price

On the strength of this accurate observation, we called the local optometrist. To assuage us—he stressed the human element, but prescribed stronger glasses.—Editor.

A Real Sleuth

Wilmington, Delaware

Sir:

. . . Isn't the caption of the picture on page 36 (April issue) in error?

This picture was taken near Kumhwa, Korea in January 1952. I was there.

Henry A. Dexton, Capt.

That's real sleuthing. The caption should have read: "Camouflaged suits make men of the U. S. Eighth Army's Second Infantry Division look like snow men as they move up to the front lines in Korea in January 1952."—The Editor.

. . . to the editor

Among Our Allies

Mafra, Portugal

Sir:

. . . I am commanding a Heavy Mortar Company. Could you send me all the information, papers, books and instructional material you have on the 4.2" Mortar M30 . . . the weapon we use in my company. Please bill me.

Would you also be kind enough to send me your latest Book Store catalog? Thank you very much.

José Lopes Alves, 1st Lt.

Lt. Alves' request was immediately forwarded to The Infantry School Book Department where it was promptly filled. When you need instructional "info," write to: The Book Department, The Infantry School. They'll take care of you right away!—The Editor.

Gremlins?

An alert member of the Weapons Department, The Infantry School, has informed us of an error in our Quiz in the July issue.

Question No. 8, page 59, second line, should read—"16th Infantry Regiment" rather than "16th Infantry Division." The answer to this question (p. 90) should read "b," 7th FA Bn., in accordance with current TIS interpretation of par 39, TC 34, DA, Nov 1952.

We pride ourselves on our accuracy and our researchers constantly check all available reference data. Sometimes, though, an error slips through. We appreciate being informed of our errors so that we, in turn, may inform our readers.—Editor

Major Find

Columbus, Ga.

Sir:

In the most recent issue of the Quarterly (July, 1954) you have a two-page picture of a group of officers being briefed in a CP. (p 18-19).

The captain in the center with a cigarette in his mouth looks very familiar. Could he be my old friend, Captain Al Hume? The helmet makes it difficult to be certain. If it is Capt Hume—hats off to your artist! It is a perfect likeness.

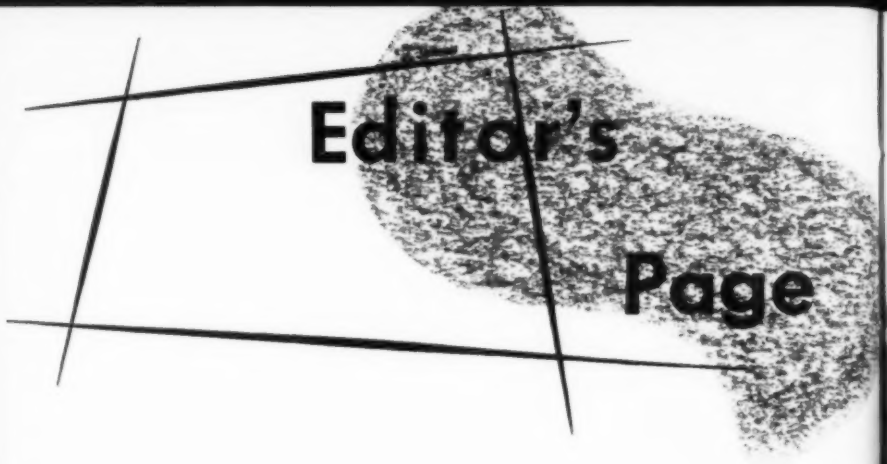
Robert A. Fielder, Capt,Inf

Yes, this is the former Capt (now Major Hume). You might be interested to know that he is now attending the Command & General Staff College, Ft. Leavenworth, Kansas.—Editor

Vip Visit

Lt Col Mogens Boisen, Chief, Danish Army Extension Courses assured us during a recent visit that ". . . The Infantry Quarterly is highly regarded by the Danish Army." His executive, Maj Kay Tretow-Loof, a long time reader concurred. The colonel then added emphatically "—when the postman loads my desk with a huge stack of magazines, I always search out The Infantry Quarterly and read it first."

We take this opportunity to publicly say thanks and to extend an invitation to each of you to pay us a visit.



Dear Reader:

EVERY once in a while we feel a certain obligation to make a report to you, our subscribers. In the last year, your magazine, The Infantry School Quarterly, has more than doubled its circulation. Each day we receive numerous testimonials to the fact that the content and layout of the Infantryman's magazine has improved.

We are constantly striving to better your magazine and make it more interesting and readable. It's our desire to offer a professional publication that every Infantryman will be proud to read and save—and show to his friends.

I'm sure you realize that we can't always anticipate the needs of our readers. We want to know what type of material you need and what will help you most. How do you like our features? If you have any comments on how we can improve your magazine—please, write us. Of course, the best method of reader expression is the submission of manuscripts. And don't forget, we pay top prices to our authors.

As you know, the INFANTRY Quarterly is not a profit-making publication. Subscriptions merely cover our printing, labor, paper and author costs. Now we're trying to improve your magazine by putting color into the cover. It's up to you. If you'll renew your subscription now and remind those among your friends who've been meaning to subscribe but have put it off—we promise you a new and finer, color-filled magazine. How about it? How about starting today?

The Editor

The soft tones of tatoo usher in the mute stillness of night . . . . Guards walk their posts . . . . Silence . . . . Darkness . . . . The garrison rests.

Today, the American Infantryman stands at the brink of a new and promising age in the pursuance of peace.

He is motivated by the same desires . . . the same convictions as Infantrymen of former days, whose earnest and persistent efforts to improve the knowledge and skill of our Infantry led to the founding of the seat of Infantry learning . . . The Infantry School. It is here that he is taught to fight effectively as an individual or as a member of an all-Infantry or Infantry-Artillery-Tank Team supported by the Navy or Air Force.

The Infantry School is dynamic in its teaching processes, developing the foot soldier of our Armed Forces to be a soldier who is strong of mind and strong of body . . . one who will have the courage and will to say "Follow Me" and the know-how to survive on the battlefield.

It is evident to all who are genuinely interested in the present, as well as the future welfare of our country, that the Infantry must continue to grow and function progressively in order to ensure military superiority. We must be prepared to take advantage of new means of transportation, to gain increased flexibility and mobility, and to integrate newly developed weapons into our units. Only by being progressive can we safeguard ourselves against the forces that would destroy the freedoms that form the foundation of our Democracy.

The American Infantryman is trusted and respected the world over by civilized minds who think of him as a true and tried friend. The only way he can maintain this lofty place in the minds and hearts of free people everywhere is to be the finest citizen and best soldier in the world.

I am confident that the Infantry will continue to build men of high ideals who are physically fit . . . mentally sound. The Infantry stands prepared . . .

Carl F. Fritzsche

CARL F. FRITZSCHE
Brigadier General, USA
Assistant Commandant

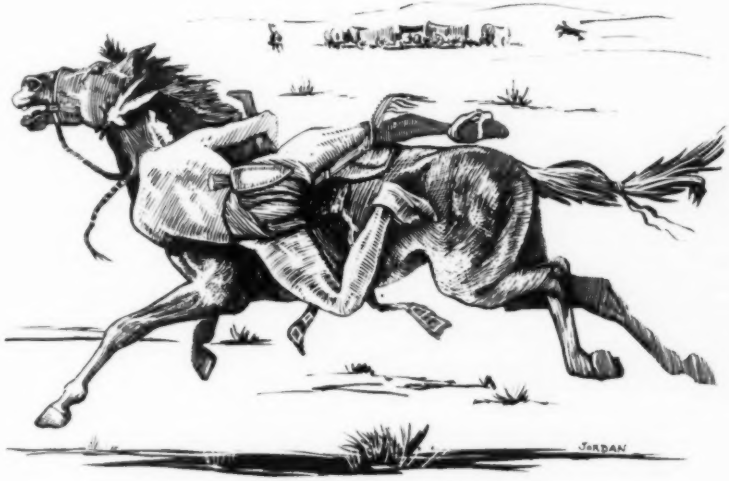
Stay Flexible

MAJOR GENERAL
ORLANDO WARD

RED Cloud did not give a second thought to the 32 soldiers who sought refuge in their wagon box corral.* Had he not destroyed Fetterman and his brave men some months before? The small company of United States Infantry facing him in the corral would fight well, but he was sure the Sioux would destroy them. The soldiers were doomed.

The Indians initially attacked mounted. They drew the fire of what they believed to be muzzle-loaders of the soldiers and moved in to the assault. This was their custom and doctrine — but now it was "Bad Medicine!" They were met with as heavy fire** as if the initial shots had not been fired. Heretofore, there had always been time enough to move in before the enemy could reload. They tried again, with the same results. "Very Bad Medicine, indeed!" thought the chiefs. They would try it on foot. They crawled toward the enclosure with great skill and determination. They were the best and bravest of the Sioux Nation but, try as they might, the "Bad Medicine" was too much for them. Their casualties were great. The Indians did not know that the troops had recently been issued the new breech-loading Springfield Rifle.

In retrospect, the



breech-loader did not have the capabilities of the machine gun. It had not outmoded the mounted charge. That was to come later.

A solution to the problem would have been, in this case (as in so many others), clear thinking on the part of the commander. Had Red Cloud ordered a mounted charge with depth to his formation or tried a mounted attack in conjunction with a dismounted one, it seems doubtful that he would have failed. The Indians hopelessly outnumbered the defenders. Instead, he forgot his mobility and attacked the position on foot. He used old methods, without change, to meet a major change in an enemy weapon encountered for the first time on the battlefield. Both the detachment and the Sioux were, no doubt, glad to see the relief party arrive from Fort Philip Kearny. The Infantrymen gave credit to the new rifle for their successful defense. The Indians charged their defeat to "Bad Medicine."

The Sioux either lacked perception or were so tied to doctrine that they failed to modify their doctrine to overcome the shorter time it took the enemy to reload. Modification in the application of doctrine to battlefield conditions was, and always will be, a command responsibility. We must remember that the FEW great commanders whose reputations survive the judgments of history are those gifted with the aforementioned, or have acquired it through training and study.

There is a tactical lesson in this fight. Red Cloud was one of a long line of commanders whose lack of foresight casts a long shadow on their military reputations simply because they failed to react, win or lose, with prescience to the dictates of the moment. He followed routine and accepted doctrine without modifying its application. He had the hind-sight which great soldiers have as foresight. On the other hand, the need for training to meet such situations has not been so obvious. In my opinion, it has been considerably neglected. Too often, in our schools and in field problems, the enemy had been represented as having little or no variety as to fighting characteristics, weapons and capabilities. The "Aggressor Force" idea was a major step in the right direction. We should go further. We must train so that our thinking and tactics will be flexible enough to permit us to meet new enemy weapons successfully, as well as to take advantage of varying enemy fighting characteristics. The question often comes to mind as one reads the accounts of World War II, "What changes would you have made had you interchanged the enemies (e.g., Japanese for Germans, Italians for Japanese)—in the various engagements in that far-flung conflict?"

Many times in history, a new weapon or a new tactical idea or formation has produced victories completely out of proportion to the importance of the change, until new

*The wagon box fight took place near Fort Philip Kearny on 2 August 1867. 32 men under the command of Capt. James Powell improvised a barricade of wagon beds and defended against 1,500 Sioux warriors until help arrived three hours after the fight began.

**The commander issued three breech-loading Springfield Rifles to each of his better marksmen and detailed the remaining soldiers to the task of loading.

his tactical thinking with each new situation.

weapons or tactical changes have been made to counter it. Our own thinking, tactics, and weapons development program must be flexible enough to insure that we can conform promptly to battle necessity.

In World War II, commanders were repeatedly faced with enemy characteristics or weapons which required direct action in order to capitalize on them or avoid defeat. Consider the problems of the Japanese tank commanders. Consider the problems of the commanders on both sides of the African and European battlefields. Here, doctrine based on equal weapon concept, met superior weapons on terrain that was both favorable and unfavorable to the superior weapon. Consider the effect of the German 88 dual-purpose gun. If you read THE ROMMEL PAPERS you will see the advantage he took as a spearheading division commander of enemy characteristics as he moved from the Rhine to Cherbourg. Try substituting Japanese troops for his enemy and see what modifications you would have made, had you faced that problem.

Training in "flexibility of mind" should be emphasized in all echelons of command by frequently introducing into the aggressor force, weapons with practical but superior capabilities. The importance of this concept becomes evident in the study of military history. The higher the command, the greater the inflexibility, and therefore, the increased need for awareness of this weakness. Every commander should go into battle with a certain amount of confidence in the superiority of his weapons and tactics, but confidence must not lead to disaster—through inelasticity of command thinking. We should be trained to react flexibly when meeting unexpected tactics and weapons. Any temporary enemy advantage must be met with quick thinking and speedy action.

I have used Red Cloud as an example. Had he won the Wagon Box fight with his dismounted attack, history would still have had to condemn his inflexibility of mind, as his casualties would have been beyond reason. Fortunately, as Liddell Hart says in his introduction to THE ROMMEL PAPERS, "History has a habit of correcting the superficial judgments that temporarily keep company with victory."

MAJOR GENERAL ORLANDO WARD (RET). As the former Chief of the Office of Military History, Department of the Army, the author is uniquely qualified to take the "long view" regarding the future.

General Ward, a 1914 graduate of the U. S. Military Academy, served in France with the 3rd Division during WW I, and commanded the 1st Armored Division in Ireland and Africa during WW II. He later assumed command of VI Corps.

An order should contain everything that a commander cannot do by himself, but nothing else.

—Field Marshal von Moltke

One Great Rif

How to B
Distinguished M

LT. COLL

"LOOK at that coffee cup, lieutenant." The captain's eyes twinkled, "Would you say it is impossible for a man with a rifle to hit that GI coffee cup endwise at—say 328 yards?"

The young officer glanced at the cup, reflected momentarily and decided on the unexpected reply. "Sir, I believe it is possible."

Though nonplussed, the captain continued: "He certainly could! Did you know that the best Swiss, Finnish and American shots can hit a cup like this 50% of the time at that distance? What's more, 90% of those same shooters would hit a dinner plate smaller than the ones we eat from at the same distance!"

The lieutenant smiled. The captain's enthusiasm was steadily rising and his face had become slightly flushed. "If you think that's something," he said, "inch a little closer —and I'll give you some really astounding facts. The world's record

Rifleman Tells . . .

Become A Marksman

OLLIS LEA

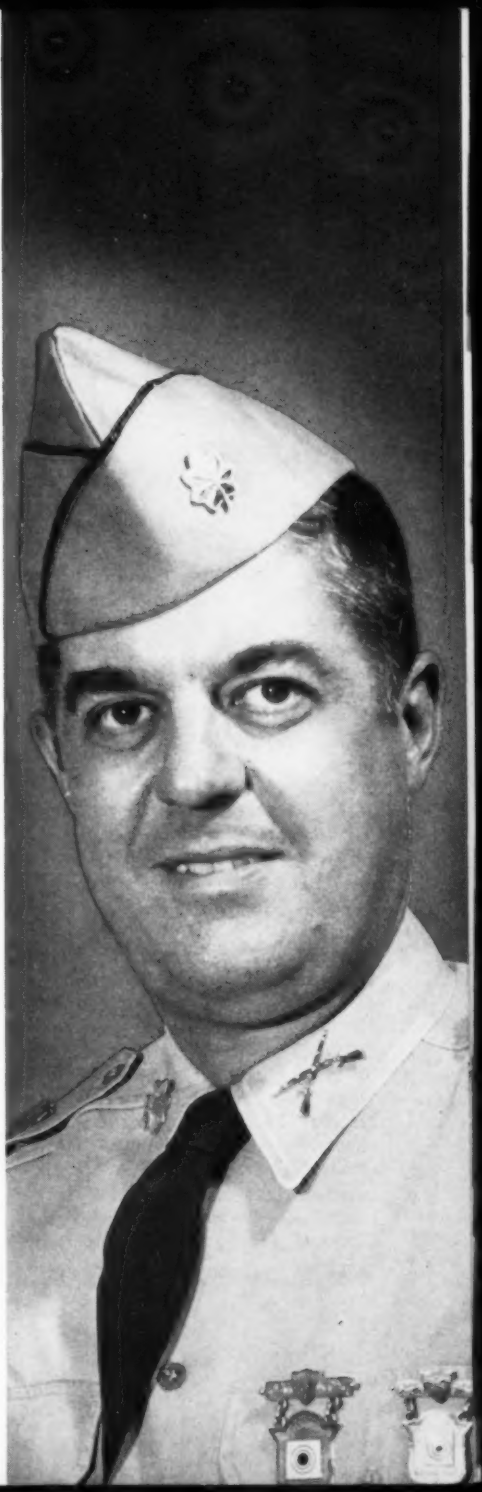
score is such that 94% of the total 120 shots fired from three different positions would hit this cup at that distance."

"That's very interesting, captain. Do you know what the world's consecutive bull's eye record is?"

"Glad you asked, lieutenant. The world's 'long run' record for 1200 yards on a 36-inch bull's eye is 41 consecutive bull's eyes. That happened at Sea Girt, N. J., where the winds coming in from the ocean constantly fishtail back and forth like a tarpon out of water."

"That's quite a record, captain."

"Yes it is, lieutenant. Speaking of record, did you know that a 72 year old man shot 74 consecutive bull's eyes at 1000 yards with an issue Springfield rifle, and left the line (without ever getting a four) only because it got so dark he could no longer see the target? Another shooter won the match, though he used a telescope-sight rifle and made



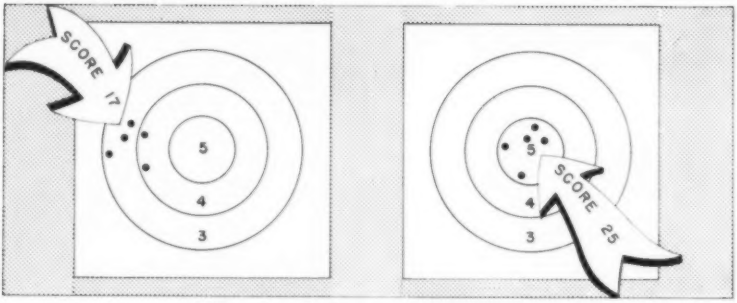


Figure 1. Center your shot groups.

about four additional bull's before he got a four."

The captain was enthused and rightly so—These records and others made by top competitors and distinguished shots are as amazing to most shooters as they were to the lieutenant. On the face of it, such records might seem the work of automatons rather than human beings. Take the case of Sgt. J. W. Adkins. He fired for three days starting at 800 yards and increasing the distance 100 yards for the following days (120 rounds prone, slow fire each day). The sergeant scored 357 fives and only three fours on a 36-inch bull.

Such shooting separates the novice from the expert, as do requirements for credits or "legs"* on the Distinguished Markman's rating. The top 10% of the competitors in an accredited match are awarded such "legs" and three are required, with certain restrictions, before the shooter can apply to the Adjutant General for the rating of Distinguish Marksman. One of these "legs" must have been won in either (1) the National Trophy Matches (team or individual) or (2) in an overseas command or army area match for placing in the upper 50% of all of those awarded the Excellence in Competition badges for that particular match.

In the National Trophy Matches (usually held in conjunction with the National Matches) the high 10% of non-Distinguished competitors get "legs" as do the firing members of the highest one-fifth of the number of competing teams. In no event will the number of teams so rewarded exceed 16 rifle teams or 10 pistol teams, and the number, naturally, can be less according to the number of teams entering.

Distinguished shooters are rated according to their score but non-Distinguished competitors are grouped separately for the purpose of determining who gets awards. If not previously Distinguished, any competitor who equals or betters the score of the lowest selected non-Distinguished enlisted competitor of the army is also awarded an Excellence in Competition badge. If the score of the top non-Distinguished enlisted competitor is so low that

* "Legs" are credits towards Distinguished rating. An "Excellent in Competition" badge.

none in the enlisted group would be awarded the Excellence in Competition badge, then, regardless of the scores fired by other competitors, no one in that particular competition would be entitled to the award. A total of 1541 individuals have been awarded the Distinguished Marksman Badge (Rifle) and 482 have been awarded the Distinguished Shot Badge (Pistol) as of March 1954.

AR 370-10 (16 August 1948) governs the competitive requirements for "legs" on Distinguished rating. DA Circular 56 (1953) delineates the match conditions under which such competitions must be fired to be accredited by the National Board for Promotion of Rifle Practice.

Authority for the wearing of "leg" medals and Distinguished badges is contained in AR 600-70. Anyone desiring more data on competitions and awards should read Col. Charles G. Rau's article, "Those Distinguished Awards," in the February 1954 American Rifleman.

So far this article has dealt with end results, the rewards of good shooting. Now, you may be asking "how-do-I-get-that-way?" Four things are required of the would-be Distinguished shot. They are:

(1) Knowledge of what to do and how and when to do it.

(2) Practice, either dry or "wet" at every available opportunity to maintain your skill at its peak.

(3) Good equipment. A rifle that is properly cared for, properly adjusted and capable of delivering the scores the shooter sets as his goal. (Remember—a good shooter may be better than his weapon if it's not adjusted and cared for properly.)

(4) Competition.

All of these are necessary but without competition a shooter may never achieve the Distinguished rating. If he cannot stand against 300-400 competitors and produce top scores without suffering "buck fever" i.e., nervous apprehension, he won't go far in competitive shooting.

There are a number of people called "barnyard" shooters—riflemen who can't shoot in unfamiliar company or surroundings. This natural reaction to excitement can be eliminated or minimized by becoming accustomed to the conditions found in matches—by getting enough match experience so that nothing worries you except the wind and squeezing off the next shot.

Physical Condition. My firm belief is that good physical condition is a must if top scores are to be obtained. For purposes of competition, it comes after following a rigid program of wet and dry firing. The fact that some men may have shot top scores while not in the best of condition doesn't prove me wrong. Such individuals have placed a definite ceiling on their scores.

The experienced shooter knows that the road to higher scores is preparatory field work—lots of it—especially dry firing. The new man often wants to dispense with preliminaries and begin shooting—right away. Remember that everything taught basic trainees (and considerably more) must be mastered by the aspirant for Distinguished ratings. The Distinguished shot goes by the "book" and develops superlative skill in sighting and aiming, trigger

squeeze (the heart and soul of good shooting), positions, sight adjustments, wind "doping," windage and sling adjustments.

The Distinguished shot keeps a meticulous score book. A rifleman trying to qualify can afford to lose a few points on record firing before he gets into the bull. The Distinguished shot is shooting for the top 10%. His FIRST shot and as many others as possible must be in the bull.

Rifles. There are good rifles and bad rifles, and a good shot knows it. When he acquires a fine rifle he needs no one to remind him to keep it clean and properly adjusted. He "loves" it, for this rifle is the tool with which he is going to reach the top.

The so-called "alibi" rules are so stringent in Army area, all-Army and National Matches, that a shooter may find himself out of the running for a "leg" if his rifle malfunctions twice in the same match. At the first alibi the firer will stop, lock the piece and call the range officer to inspect the weapon. If the alibi is the **fault of the rifle or ammunition** he will be allowed to refire. Should the shooter have another "jam" or malfunction on the second score he had better hand feed the piece or prepare to receive a miss for every shot not fired. This rule places a premium on the proper care, cleaning and functioning of rifles and pistols used in competition. This, too, is a must for soldiers going into combat — an enemy will not give you the first alibi.

Shot Groups. Run of the mill sharpshooters and experts commonly ignore the following:

(1) Placement of shot groups

(2) Keeping of score cards

(3) Blackening of sights.

These are things a Distinguished shot never overlooks. He cannot afford the handicap that such neglect would cause. In Figure 1, note that identical shot groups, centered at different points on the target, result in widely different scores. This is something the trained rifleman constantly watches. If the center of the shot group on his last 2 or 3 shots is not in the center of the target **and he did not call them where they hit,** he immediately makes a full sight correction to properly center them. A candidate for Distinguished rating cannot lose 30 or 40 points and still make the grade. He can ignore nothing that will bring him higher scores.

Score Books. The score book is a record of the performance of the rifleman and his weapon under every condition that matches or practice have called him to shoot under. It must be properly kept. The rifleman will later be able to place his first round, the important one, into the bull by finding in his score book past conditions that equal or parallel present conditions. If you have had the "gone" feeling that results from not being on the 6 x 4 foot, 1000 yard target frame after firing your first, fifth, or tenth record shot, you know what I mean. You can't overestimate the value of keeping a score book if you're interested in keeping your firing first-rate.

"Shoot fast in the Wind." One tip on competitive shooting not covered in the Field Manual is **Shoot Fast in the Wind.** I do not mean to jerk a shot. I mean do all your score bookkeeping and sight setting between

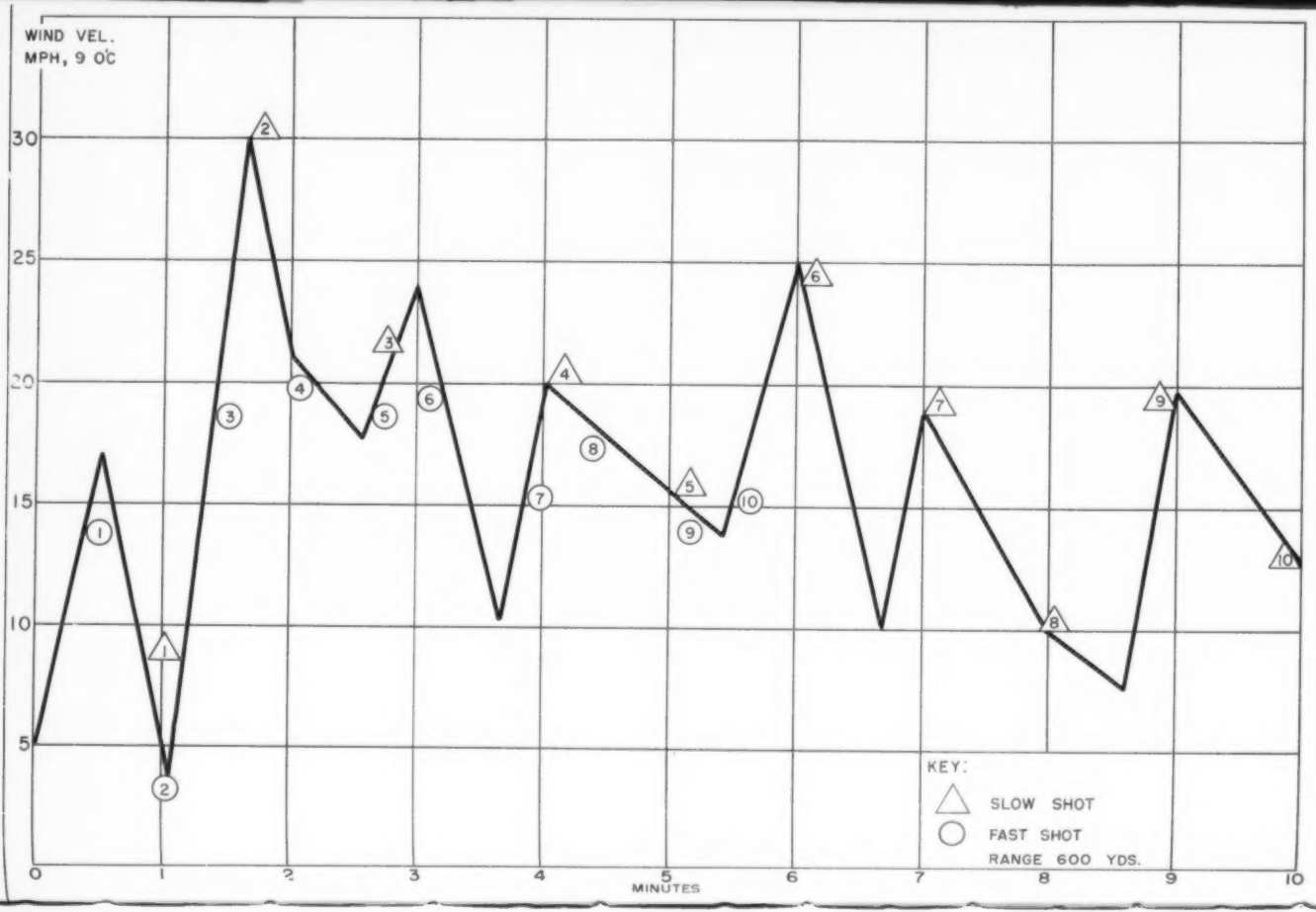


Figure 2. Shoot fast and get the breaks.

shots with as little lost time as possible.

For example: let's assume that your target comes out of the pits and you find the bull you called was 100% correct. No sight changes are necessary—shoot the next shot as soon as the marking disc is out of the way. Next plot the location of your previous shot, record any sight changes made on the shot just fired and the call for that shot. Reload and get ready for the target to come out of the pits. **Shoot first**, keep books and make sight changes while the target is in the pit.

Windage. Examine Figure 2. Let us assume that you are firing at a range of 600 yards. Also assume that you are shooting so slowly that you will need the full 10 minutes allowed for firing 10 shots. Using the formula

$$\frac{RV^*}{10}$$

compute the number of clicks of windage necessary to center the shots fired at the times the numbers in triangles are shown. The slow firer will have to make 10 changes to compensate for shots that will be blown from 36 inches to 108 inches away from the center of the bull because of the wind.

Using the same windage formula and plotting the circled number shots of the fast shooter, we find sight changes must be made to compensate for 36 inches to 108 inches of wind, but that a greater number of shots can be fired quickly, with little or no sight change. Only five windage changes are necessary during this firing. If the shooter failed to make a windage change between shots 3 and 10, with good calls, he would get no worse than five 5's and three 4's. Shots 3, 4, 5 and 6 should be fired with 11 clicks left windage, shot 7 with 9 clicks, shot 9 with 8, and shot 10 with 9 clicks left windage. A shooter that cannot recognize 2 clicks difference in the wind is, in my opinion, a long way from a Distinguished rating.

No Short Cuts. Americans are a hurry-up crowd. We like to get things done in less and less time. Since this seems to be a national habit, many may immediately start looking for a short cut to top scores. **There is no easy road to a Distinguished rating!** FM 23-5, The Rifle, Cal. .30 M1, spells out the details and the rest is unadulterated sweat and toil—but fun if you like to shoot. Shooting, you recall, is not only good sport but the soldier's best means for staying alive.

Shoot at every opportunity. Don't get sloppy even if you only fire 20 rounds. Good shooting is the result of good shooting habits. Dry shoot and wet shoot whenever you can. Don't neglect the competitive angle and some day you may earn the army's top competitive shooting medal, the DISTINGUISHED MARKSMAN'S BADGE.

LT. COL. ELLIS LEA is both a Distinguished Marksman and Distinguished Pistol Shot, a rare combination. He has been active in competitive shooting for 26 years, holds nearly 400 shooting awards and captains the U. S. Army Pistol Team. Currently, his mastery of weapons is being utilized by the Small Arms Committee of The Infantry School.

*Range (in hundreds of yards) times the velocity of the wind (in miles per hour) divided by 10. This will give you the number of clicks of windage required to be taken in the necessary direction.

Answer the following questions to determine whether you are a bolo, recruit, marksman, sharpshooter, or expert.

1. Documents taken from a prisoner of war should be marked and:
   a. Sent immediately to division headquarters for examination.
   b. Sent to the regimental S2 in a sealed envelope by special messenger.
   c. Returned to the prisoner in keeping with the Geneva Convention.
   d. Given to the prisoner of war escort for evacuation with soldier from whom taken.

   (*Question worth 15 points*)

2. What are three effective uses for the White Phosphorous Hand Grenade?

   (*Question worth 10 points*)

3. When using the bracketing method of adjustment with the 60-mm mortar, the observer attempts to have his first round:
   a. Short of target.
   b. Over the target.
   c. Hit the target.
   d. Either over or short of the target.

   (*Question worth 15 points*)

4. One click of elevation or windage on the M1 Rifle will move the strike of the bullet on the target:
   a. Two inches for each 100 yards of range.
   b. One inch at 200 yards of range.
   c. One inch for each 100 yards of range.

   (*Question worth 10 points*)

5. When organizing a perimeter defense (choose the best answer):
   a. In close terrain, early and continuous patrolling is not necessary.
   b. Mutual support between adjacent units on the outer perimeter is disregarded.
   c. All machine guns are employed on the outer perimeter.
   d. If the probable direction of the enemy attack is known, the perimeter may be unbalanced to meet the threat.

   (*Question worth 15 points*)

6. In conducting military instruction the best technique in asking a question is to:
   a. Call on a soldier by name, have him stand up, then ask him the question.
   b. State the question and ask for a volunteer.
   c. State the question, pause, and call on a soldier by name.
   d. State the question and call on a soldier who appears inattentive.

   (*Question worth 10 points*)

7. What three types of ammunition are issued for use with the 105mm recoilless rifle?

   (*Question worth 10 points*)

8. What is the preferred method of employment of the 105mm Recoilless Rifle Platoon: attachment of sections to the rifle companies, or general support? Why?

   (*Question worth 15 points*)

Turn to page 112 to see how you rate. Look for another QUARTERLY Quiz in the next issue.

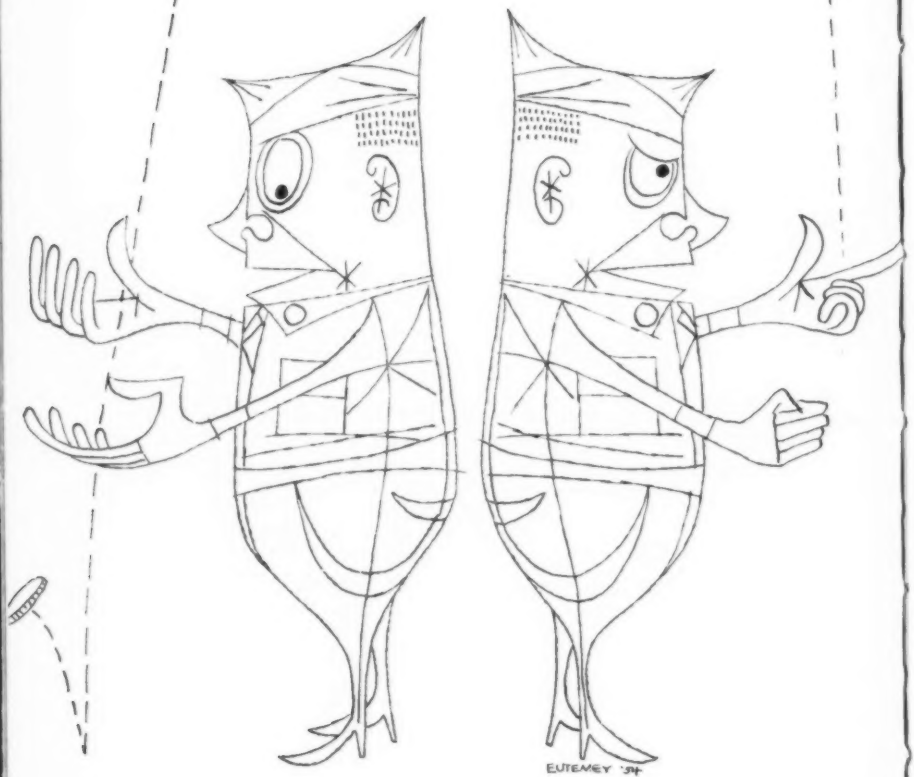
When you are called upon

to administer a unit Fund,

be sure you . . .

Don't Fumble Your Fund

Capt. Delmar A. Pugh



PERHAPS you have been custodian of a unit fund or a member or recorder of a unit fund council . . . or perhaps, at one time or another, you may have been required to inspect and audit a unit fund.

If you have, then you know (all too well) what headaches are involved in keeping a unit fund ready for inspection at all times.

Regardless of whether you have or haven't been directly involved with the administration of a unit fund, sometime during your army career it is very likely that you will be called upon to administer, or aid in the administration of such a fund.

Are you prepared to do this? If not, you may find yourself in trouble.

The following questions and answers will tell you exactly what you need to know about unit fund administration.

Definitions

Q—What is a unit fund and what is its purpose?

A—A unit fund is a non-appropriated welfare fund found in each unit of company size, and is established to provide welfare facilities and services for the primary benefit of enlisted personnel. By welfare services and activities, we mean items which will contribute to the comfort, pleasure, contentment, physical and mental improvement of the enlisted men of the unit to which the fund belongs.

Q—How is the fund designated?

A—The official designation of the unit fund should include the name of the fund, the organization to which it pertains, and the installation.

Q—What is nonexpendable property?

A—Nonexpendable property is property other than real estate which does not lose its identity and is not consumed through normal use . . . such as radios, pool tables, television sets and day room furniture.

Q—What constitutes expendable property?

A—Expendable property (see figure A) is that property which does lose its identity in use and is consumed or expended when used . . . such as writing paper, envelopes and food. For purposes of unit fund accounting, athletic equipment such as balls, bats, gloves, shoes and uniforms are considered as being items of expendable property.

Sources of Income

Q—What is the major source of income for a unit fund?

A—A monthly dividend is distributed to each unit fund from the Post Trust Fund. The Post Trust Fund in turn, receives its money from the profits of the Army Exchange Service (Post Exchange) and the Army Motion Picture Service (Movies) that are in operation on our army posts.

The money the unit fund receives from the Post Trust Fund is the *major* source of income for the fund. For many unit funds, it is the only source of income available.

Q—What are other authorized sources of income for a unit fund?

A—Other authorized sources are:

1. Special grants from other welfare funds authorized to provide financial assistance. However, a complete justification must be made when applying for a special grant.

2. A nominal service charge may be assessed from participants of a fund owned enterprise. For example, a small charge may be assessed each player who uses a fund owned pool table.

3. Although it is rare, a unit fund may be of such wealth that it can invest some of its money in government bonds or securities. The dividends on the government bonds and securities would be sources of income for a unit fund.

4. Money that is derived from the sale of fund-owned unrepairable, worn out or salvageable property can be a source of income. For example, if the fund owned a radio in which the expense for repairing it would be greater than its worth, the radio could be sold.

5. Any money received as contributions or donations can be another source of income.

Custodian and Unit Fund Council

Q—Who is the custodian of a unit fund?

A—The commanding officer of the unit to which the fund pertains, is the custodian and is charged with the administration of the fund with the advice of the unit fund council.

Q—What are the other duties performed by the custodian?

A—The duties of the custodian are as follows:

a. Maintains the necessary records.
b. Receives all assets of the fund.
c. Makes all disbursements from the fund with the approval of the unit fund council.
d. Safeguards the assets of the fund.

Q—What are the duties and responsibilities of the custodian regarding the safeguarding of property and money owned by the fund?

A—Safeguarding the property by the custodian means the ascertaining by him that the property is present in the unit at all times and is not misused or abused in any way. By safeguarding the money, we mean that the fund money must be kept in national or state banks which are members of the Federal Deposit Insurance Corporation. These bank accounts will be kept in the name of the fund itself and *not* registered in the name of the custodian. Payments from the unit fund are made by check. It is only with permission of the unit fund council that the custodian may keep cash in his personal possession. This we call "petty cash" and, if authorized, it will not exceed $25.00. This money is kept at the risk of the custodian and usually if he loses it, he is required to reimburse the fund for the amount lost.

Q—Who are the members of the unit fund council and how are they chosen?

A—The unit fund council will consist of three military officers who are assigned to the unit and will be appointed by the unit commander. When less than three officers are present within a unit, the commander may designate noncommissioned officers to serve on the council in lieu of

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CAPT. DELMAR A. PUGH is a graduate of OCS ('42), the Infantry Officer Advanced Class ('44) and the Command and General Staff College ('53). Between schools, Captain Pugh served in two wars. In WW II he was with the 100th Division and in Korea the "Tropical Lightning" 25th. This is his second article for the Quarterly. The first was "S-1 Checklist," published in January '54. Captain Pugh is now with The Infantry School.

Record of Expendable Property

Date Received	Articles	Value		Disposition
5 Jan 54	7 Boxes stationery	14	00	Used in day room, last box consumed 18 Apr 54
15 Jan 54	6 Brooms	12	00	1 broom broken 7 Mar 54
2 Mar 54	3 gals paint, blue	15	00	Used to paint mess hall, 14 - 15 Mar 54
2 Mar 54	1 gal turpentine	3	00	
13 Mar 54	10 Basketball jersies	35	00	
	10 Basketball trunks	35	00	
	10 Basketball shoes	30	00	
25 Mar 54	24 Writing tablets	24	00	
25 Mar 54	1 gross envelopes	1	00	

NOTE: This is a sample method of maintaining "Unit Fund - Expendable Property Record". Any similar form locally reproduced by units is satisfactory.

officers. The senior member of the council will serve as president, and the junior member will be the recorder.

Q—What are the duties of the council?

A—The duties of the unit fund council are as follows:

(1) To inspect and audit the fund in order to ascertain that the fund is being properly administered.

(2) To ensure that the fund is properly safeguarded.

(3) To approve all disbursements of the fund after determining that they are within the purpose of the fund and are necessary.

(4) To determine the necessity of insurance on fund-owned property.

(5) To plan for the replacement of fund property and for the financing of other normal future requirements.

Authorized and Unauthorized Expenditures

Q—What are authorized expenditures?

A—The following are authorized expenditures:

(1) Purchase of supplies, equipment or services which contribute to the entertainment, recreation, comfort, or education of the enlisted men of the unit, or garnishment of the unit mess. For example — writing paper for the dayroom or athletic uniforms for a company team.

(2) Purchase of materials or services for the maintenance, preservation or protection of fund-owned property. For example—insurance on a valuable fund-owned item, repair of a radio or the purchase of locks for protection of fund-owned property.

(3) Awarding of individual prizes, either cash or property, for military, educational, or recreational contests conducted by the fund. All members of the unit must have equal opportunity to participate in the contest being conducted. These prizes will not exceed a value of $25.00.

(4) Purchase of labor saving devices not obtainable through supply services.

(5) Purchases of supplies or services for emergency maintenance of government-owned welfare and recreational property issued to the company.

(6) Purchase of authorized distinctive insignia or uniform trimmings for issue without cost to enlisted men of the unit.

Q—What are unauthorized expenditures?

A—The following are unauthorized expenditures:

(1) Purchase of services or articles which do not further the purpose of the fund.

(2) Purchase of services or articles for the primary purpose of conducting official business. Examples of this are rubber stamps, pen desk sets and typewriters for use in the company orderly room.

(3) Purchase of any item which cannot be paid for in full with the money presently on hand or money to be received within 30 days (unless prior written approval is obtained from the next higher commander).

(4) Loans, contributions or donations will not be made to any individual or welfare agency unless specifically authorized by Department of the Army.

(5) Purchases will not be made of items usually available

through normal supply channels unless items are immediately necessary and cannot be issued due to being unavailable. To purchase such items, a certificate known as a Certificate of Non-Availability will be obtained by the custodian from Regimental Supply Officer or other appropriate issuing supply agency (stating that the requested items were not available at that time).

Preparation of Records and Reports

Q—What is the basic record of unit fund accounting?

A—Council book (DD Form 251) is the basic accounting record in maintaining a unit fund. It consists of a property section in which all items of non-expendable property received by the fund are recorded. It also contains a cash section for the recording of all transactions involving money disbursed or received by the fund. There is a certificate page immediately following each cash page for the necessary signatures of the custodian, president and recorder of the council, and the inspecting and auditing officer. Changes and corrections in the council book will be initialed by the custodian.

Q—What should we know in order to make proper entries in the property section?

A—(1) All nonexpendable property acquired by the unit fund by purchase, gift or loan will be entered in the property section. The "price" column in the property section will be used for all property entered in the council book. All entries will include the date obtained, a description of the article and the price or value.

(2) All nonexpendable property received as a gift, will be entered in the property section in the same manner as property purchased by the unit fund, and the actual or appraised value will be entered in the "price" column.

(3) All nonexpendable property on loan, including property from the Central Post Fund, should be recorded on separate pages of the property section of the council book. The actual or appraised value of these items will be entered in the "price" column. A large portion of the furniture used in company dayrooms is loaned property from the Central Post Fund. It is issued on a property receipt prepared by the loaning fund and will identify the property. A duplicate copy of the receipt will be filed with other property records of the unit fund. Property on loan will not be removed from the installation without prior approval of the lender.

(4) When a new council book is opened—the original date of purchase, the article and the original price will be transcribed to the new council book. In the "disposition" column of the old book, the entry, "Trfd to new book," will be made.

VO. NO. 54

DATE 19 September 1953

VOUCHER

Unit Fund, Company B, 85th Infantry, Fort Benning, Ga.
(NAME OF FUND)

DATE	DISCRIPTION	AMOUNT RECEIVED	AMOUNT PAID
19 Sep 53	Initial payment to Static Radio Shop, for 1 - KR2 Television Set		200 00
	TOTAL		200 00
	LESS DISCOUNT		
	NET		200 00

I certify that the above account is correct and that --

a. The goods or services paid for by check No. ..33... were actually received.

b. ~~The amount received was due and authorized, and was received by cash, check~~
(Strike out whichever does not apply.)

(Strike out a or b, whichever does not apply.)

George D. Brennan
Custodian
Capt, Inf

B

Q—What must we know to properly make entries in the cash section?

A—A new cash page is opened for each month and closed out at the end of that month, or when custodians

10
15 SEP 54

UNIT FUND CO B 85TH INF FT BENNING, GA.

TO STATIC RADIO SHOP, COLUMBUS, GA

DELIVER TO UNIT FUND CO B 85TH INF

ADDRESS FORT BENNING, GA.

TERMS $200.00 ON DELIVERY; $100.00 ON 15 OCT 54; $50.00 PER MONTH ON UNPAID BALANCE.

Quantity	Stock No.	Description	Unit	Cost			
				Unit		Total	
1	XR2	TELEVISION SET	EA	450	00	450	00

INSTRUCTIONS:
1. The Unit Fund will not be liable for the payment of any bills for merchandise or services unless covered by a Purchase Order.
2. Mail all invoices to the Unit Fund.
3. The United States Government does not guarantee payment of invoices under this order.

UNIT FUND

George B. Drennan
CUSTODIAN Capt, Inf

(C)

change and the unit fund is transferred. All transactions involving money disbursed or received will be recorded in the cash section of the council book. There is a certificate page following each cash page for the necessary signatures of the custodian, president and recorder of the council, and the auditing officer. The ration savings section of the cash page is used only by those units authorized to subsist on garrison rations.

Q—What is a voucher and how is it prepared?

A—A voucher (see figure B) is a certificate of a cash transaction prepared by the custodian in support of the receipt or disbursement of cash whether by currency, coin or check.

A voucher will be prepared to evidence *each* transaction involving the receipt or disbursement of cash, or to summarize a series of such transactions occurring in one month pertaining to a single project, such as a unit dance or banquet. The voucher will contain a detailed description of the item or items received or the reason for cash disbursed. In addition, it is recommended that the vendor's name and the use of the item, or reason for the purchase, be noted on the voucher. This certificate will be signed by the custodian.

Vouchers will be numbered consecutively, beginning with number 1, for each calendar year. A single series of numbered vouchers will be used for receipts and disbursements.

Copies of purchase orders, invoices, statements, bills, receipts, bank deposit slips, or other related papers will be attached to the vouchers describing the transaction.

Vouchers will be filed by months in numerical order. A recommended system is to file the vouchers numerically on the right side of a manila folder, with the most recent voucher on top. One manila folder will be used for each month.

Q—When is a Purchase Order used?

A—A purchase order will be used (see figure C) in ordering goods or services when payment is not made at the time of purchase. They will be prepared in duplicate and numbered in a series beginning with Number 1 for each calendar year. The original copy will be forwarded to the vendor and the duplicate will be maintained in a permanent file. Data, such as: date of delivery, partial deliveries, back order notices and cancellation of orders, will be noted on the retained copy of the pertinent purchase order.

Q—What is the Charge Purchases Register used for?

A—This record is used to record the liabilities of the unit fund, caused by the purchase of goods on a time payment plan. It will indicate the delivery date of the merchandise or services, the date and amount of each cash payment and the balance owed vendors for the purchases at any given date.

Q—What information should be contained in the Monthly Statement of Operations and Net Worth, and who prepares it?

A—This statement (see figure D) will report the cash receipts, net expense, increase or decrease in net worth, assets, liabilities, and the net worth of the unit fund as of the last day of the month. In addition, the average daily strength of the company for the entire month, the net worth per man and the amount of the dividend due for that month will be recorded. The average daily strength is determined by averaging the figures on line 4 of the morning report (total present for duty, including both assigned and attached personnel) for the entire month. It includes both officer and enlisted strengths. This figure is used to compute the amount of the monthly dividend due to be paid to the custodian of the unit fund by the cus-

Co "B", 85th Infantry, Fort Benning, Georgia
(Unit Fund)

MONTHLY STATEMENT OF OPERATIONS AND NET WORTH
MONTH ENDING 28 February 1954

1. NET WORTH 1 February 1954 ----------$255.55
   (Assets Less Liabilities 31 January 1954)
2. CASH RECEIPTS (Per Council Book) ----------$82.00
3. NET EXPENSE:
   a. Liabilities, 28 February 1954 ---------None
   b. Liabilities, 31 January 1954 ----------None
   c. Liabilities, Increase (or Decrease)----None
   d. Cash Disbursements (Per Council Book)--$69.00
   e. Total Net Expense----------$69.00
4. NET WORTH INCREASE (~~OR DECREASE~~)----------$ 13.00
5. NET WORTH 28 February 1954----------$268.55

   Consisting of:
   a. Cash in Bank and on Hand ---------$268.55
   b. Petty Cash ---------- None
   c. Government Securities ---------- None
   d. Total Assets ----------$268.55
   e. Liabilities, 28 February 1954 (Listed on Reverse Side)-None
   f. Net Worth, 28 February 1954 ----------$268.55

6. AVERAGE DAILY STRENGTH, MONTH OF FEBRUARY 1954 --------- 185
7. NET WORTH PER MAN (Item 5 ÷ Item 6) ---------- $1.45
8. DIVIDEND DUE FOR FEBRUARY 1954 (185 X $0.45) ---------- $83.25

George B. Drenner
Captain Infantry
Custodian, Unit Fund

Paid $83.25 by Post Trust Fund Check No. 1313 dated 5 March 1954.

John K. Stearns
Lt Col Infantry
Custodian, Post Trust Fund
Fort Benning, Georgia

(D)

todian of the Post Trust Fund. Under current regulations, the unit fund receives 45 cents per man per month during its normal operation.

The custodian of the unit fund will prepare a Monthly Statement of Operations and Net Worth, in triplicate, reflecting operations for the preceding month. The original and one copy will be forwarded to the custodian of the Post Trust Fund to reach him on or before the third duty day of each month. The remaining copy will be retained by the unit

REPORT OF AUDIT

Fort Benning, Georgia
(Station)

3 April 1954
(Date)

1. Regimental or similar commander C. O. 85th Infantry

2. Designation of fund Unit Fund, Co. "B" 85th Infantry

3. Custodian George B. Drennen, Capt, Infantry

4. Inclusive period audited: From 1 Oct 1953 to 31 Mar 1954

5. Date of performance of audit 3 April 1954

6. I certify that I have audited the above fund and am cognizant of the applicable provisions of the following references: AR 210-50, SR 210-50-1, SR 210-50-21, TM 14-1008 and the Reports of Audit submitted by previous auditors.

7. The following documents were available for audit: (Add any other appropriate documents; if any not available, give reason): Council Book, Voucher File, Check Book, Record of Expendable Property; Charge Purchases Register.

8. Deficiencies noted in this audit were:

a. Council Book not signed by Recorder for month of Oct 53.

b. Disposition of worn out curtains not indicated by custodian in property section.

9. Deficiencies reported by previous auditor and not corrected at the time of this audit were:

a. None

10. Commercial concerns in this vicinity who normally grant discounts are:

a. All Sports Co, Columbus, Georgia.

b. A. A. Schwartz Co., Columbus, Georgia.

c. A-1 Hardward Co., Columbus, Georgia.

11. I have verified the use of the following items of property listed in the Council Book, all of which were (~~were-not~~) found to be present and are (~~are-not~~) being used to further the purpose of the fund:

6 Mirrors
1 World Atlas
3 Lamps, Table
1 Television Set

12. The following comments and/or recommendations are submitted:

None

(Signed) William W. Williams
(Typed) WILLIAM W. WILLIAMS
Major, Infantry
Auditor's Signature

NOTE: Strike out words not applicable. (E)

fund custodian. At least quarterly, a copy of this statement will be posted conspicuously for examination by the personnel of the unit.

The original copy of the Monthly Statement of Operations and Net Worth will be returned to the custodian of the unit fund. The Post Trust Fund custodian will record in the space provided at the bottom of the original statement, the date, amount, number of the check representing the dividend payment, and his signature prior to returning this statement to the unit fund.

Q—What procedures concerning the monthly bank statement and cancelled checks are prescribed for the custodian?

A—At the close of each month, the bank statement will be obtained from the bank as soon as possible. The balance on the bank statement will be reconciled with the balance carried forward in the council book and the balance in the check book. Cancelled checks may be attached to the corresponding check stubs or to the bank statement, depending on the local authority. These cancelled checks represent additional proof that a certain amount of money has been spent and who received that money.

Audits and Transfer of Funds

Q—When are audits required (see figure E) and by whom are they performed?

A—(1) The unit fund council will audit the fund as of the last day of each month.

(2) Unit funds will be audited at least once every six months by a disinterested officer appointed by the major unit or installation commander.

(3) An audit of each unit fund will be performed at least once each year by the Inspector General of the installation at which the unit is located.

(4) Unit funds will also be audited upon a change of custodian, upon inactivation or when the entire unit changes station.

Q—What is the procedure involved when unit funds and records are transferred temporarily?

A—When the custodian of the unit fund will be absent from his unit for a period of more than 5 days and not exceeding 30 days, he will designate an acting custodian who will assume responsibility for the fund during the period of absence by means of a memorandum receipt.

During combat or simulated combat, if, in the opinion of the commanding officer, the fund may be lost—the fund and its records will be left with an interim custodian who will give a receipt for them. This interim custodian will *not have* authority to make disbursements. Upon relief of the unit, or when otherwise requested to do so, the interim custodian will return the fund to the custodian. If the custodian has changed, through becoming a casualty or being transferred, the unit fund will be transferred to the new company commander. Within the Infantry regiment, this interim custodian is normally the military personnel officer or some other individual who normally works in the rear area.

Q—What becomes of the unit fund in cases of a permanent transfer?

A—If a custodian is absent for a period exceeding 30 days, another

CERTIFICATE OF TRANSFER
UNIT FUND
Fort Benning, Georgia

DATE: 5 April 1954

Fund of Company "B", 85th Infantry

ASSETS:

1.	Cash on hand	$ None
2.	Cash in bank	197.00
3.	Securities on hand	None
4.	Amounts due fund	None
	Total Asset	197.00

LIABILITIES:

1. Outstanding Bills (List bills below) — $ None (Total Amount)

NAME OF CONCERN

2. Outstanding Checks (List Checks below) — $ 25.48 (Total Amount)

No	Date	Payee	Amount
139	25 Mar 54	Schwartz & Co	$25.48

Total Liabilities $ 25.48

NET VALUE $ 171.52

Balance as shown in Council Book as of closing date $171.52

Balance as shown in Check Book as of closing date $171.52

Bank Balance as of Closing Date $197.00

Date of last check 25 Mar 54 ; Check No. 139

I certify that to the best of my knowledge and belief this statement is a complete and accurate record of the Unit Fund, Company "B", 85th Infantry, revealing all outstanding liabilities and amounts due, and that the property owned by the Fund is on hand.

George B. Drennen
GEORGE B. DRENNEN
Captain, Infantry
Custodian

I certify that I have this date received the assets of this organization as listed. I further certify that the property of the organization, as listed in the front of the Council Book, is on hand.

Stephen S. Stephenson
STEPHEN S. STEPHENSON
1st Lt, Infantry

(F)

custodian will be designated by the appointing authority and the fund formally transferred. The following will be accomplished in a permanent transfer of the unit fund.

a. The cash page of the council book will be closed out and balanced as of the date of transfer, and the certificate page will be completed.

b. A bank statement, indicating the amount of money in the bank as of the date of transfer, will be secured and reconciled with the worth of the fund as indicated in the council book and the check book.

c. The bank will be notified of the change of custodian and provided with the signature of the new custodian.

d. A joint inventory of fund-owned property will be made by the old and new custodians.

e. The fund may be audited by a disinterested officer appointed by the major unit or installation commander. Any discrepancies discovered are the responsibility of, and will be corrected by, the old custodian.

f. A Certificate of Transfer will be completed (see figure F). It will contain a statement of the present assets and liabilities, and will include a certificate signed by the old custodian as to the correctness of the entries. The new custodian will acknowledge receipt of the fund by means of an appropriate certificate (after satisfying himself of the accuracy of the statements and property records).

g. When extensive audit is required, the acceptance by the new custodian may be conditioned upon the verification by the audit.

Disposition of the Unit Fund

Q—What is the disposition of the unit fund?

A—The council book, voucher file, check book, and any other fund records are retained for three years after the date of the last audit as indicated in the council book. At that time, if there is no pending action concerning any of the vouchers or entries in any of the records, these records may be destroyed.

* * *

There is a great deal to know about unit fund administration. The information necessary for proper unit fund administration has been covered, in detail, in the preceding questions and answers. As administrators and/or potential administrators, it should be of great value to you.

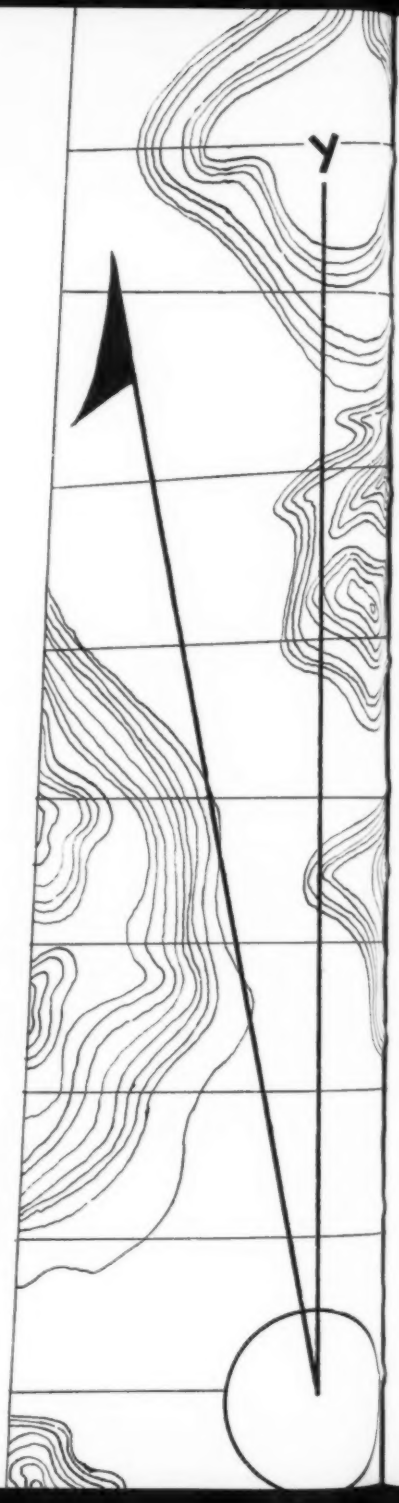
To avoid the unit fund blues, we suggest you keep this information handy . . . you may need it sooner than you think.

●

DON'T GIVE HIM THAT CHRISTMAS TIE!
He'll never wear it.
Next Christmas he'll give it to Uncle Herbert.
Uncle Herbert will never wear it either. . . .
BUT
BOTH of them need . . . want . . . and will use a subscription to The Infantry School Quarterly, the only magazine for Infantrymen!

THE GM ANGLE . . . PROBLEM OF THE PAST

CAPT. MILES C. VAUGHAN



"THERE it is, straight ahead of us," exclaimed the pilot, his face pressed against the window of the airplane. His passenger slid into the seat behind him and peered out. In front of them lay the lifeless wonder of the magnificent ice sheet that covers the huge mineral deposit known as . . . the Magnetic North Pole.

Because of the location of this mineral deposit on Boothia Peninsula, north of the Hudson Bay Region, an angular difference exists between Grid North and Magnetic North.

We all realize that a compass reading taken in the field cannot be accurately plotted on a map without first compensating for this difference. The Magnetic Azimuth must be converted to a Grid Azimuth. Similarly, an azimuth obtained from a map (Grid Azimuth) cannot be applied directly to a compass (Magnetic Azimuth) without first converting the Grid Azimuth to a Magnetic Azimuth.

The method of teaching how to determine the G-M Angle, as well as the learning process, has been a difficult problem. It was this situation that prompted me to find a new technique which would help both student and instructor. After a number of failures, I finally discovered what is

now called—the False Line of Sight Method of determining the G-M Angle. It has enabled me to effectively teach the subject and what is more important — students get the material quickly.

(Since each of us has been, or will be, a map reading instructor at some time during our career, I have presented this material not only for the reader's edification, but as an aid to instructors. With little change this material can be used as a conference.)

What follows is a particularly effective way of putting this subject across. We find it works especially well with "green" map readers. With necessary modifications, it proves equally effective on more advanced map readers.

Use the introductory material in paragraphs 1-3 above and draw Figures 1 and 2 on the blackboard. Once this is accomplished, the explanation accompanying each illustration is used to explain what it means. (Follow the same procedure with each of the figures, examples and problems that follow.)

A G-M Angle has two parts, the angular difference expressed in degrees and a direction. If you stand at the bottom of the Grid Line in Figure 1 and look North, does Magnetic North lie to the East or West of Grid North? East is correct. Therefore, your complete G-M Angle is 15° East. If we look at Figure No. 2, it can be seen that maps of different sections of the earth will have different G-M Angles.

In the Marginal Information of every map appears what is known as a Declination Diagram (See Fig-

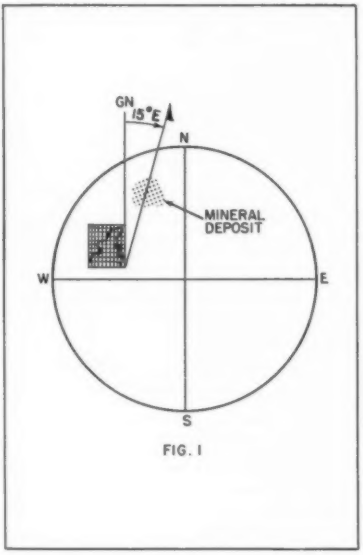


FIG. 1

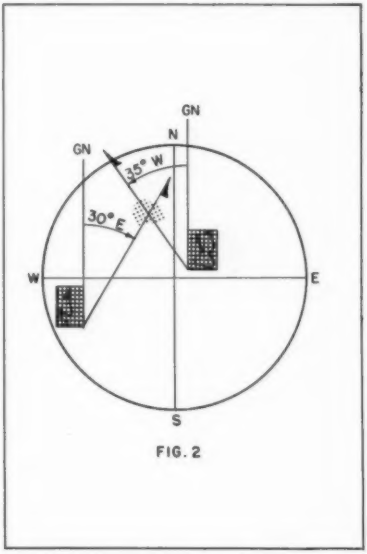


FIG. 2

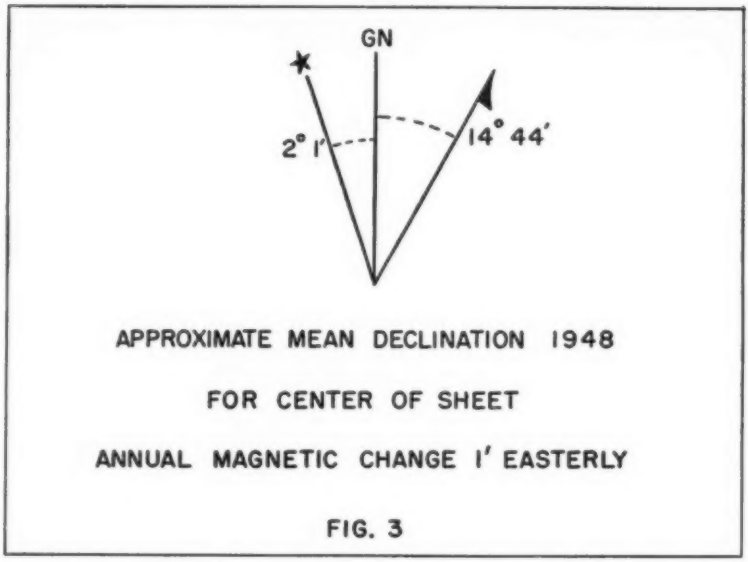


FIG. 3

ure No. 3). This diagram gives you the exact G-M Angle for the pertinent map. The diagram indicates that the G-M Angle was 14°44' Easterly in 1948. It also states that the annual magnetic change is 1' Easterly. This change is due to the fact that the magnetic deposit north of the Hudson Bay Region is shifting constantly. Luckily, this shift is constant and can be forecast. By 1954, the G-M Angle has increased 6', making the present G-M Angle 14°50' East, and because we figure angles to the nearest one-half degree, the G-M Angle is now 15° East.

The line with the star is True North. It is not required for map reading by Infantrymen.

As an added fact, never use the North arrow to orient your map. It is a diagram only and is not to scale.

Do you know what would happen if we were operating in an area whose map had a G-M Angle of 15° E, and we failed to compensate for this difference?

Let us assume that we are located in an O.P. and we observe enemy activity to our front at a distance of 2000 yards. With our compass, we determine that the azimuth to the enemy is 90°.

Our next step would be to duplicate this line of sight and distance to the enemy on our map, so that we would be able to read off the grid coordinates and call in friendly mortar fire.

A glance at Figure No. 4 indicates that a magnetic azimuth of 90° taken on the ground will not duplicate the same line of sight when plotted on the map. You must add or

subtract the G-M Angle. If you add when you should subtract or vice-versa, you will miss the target by the alarming distance of 1,067 yards laterally.

This example indicates the military need for familiarity with the G-M Angle and why the angular difference between Grid North and Magnetic North must be considered. It graphically illustrates the serious consequences of making an error in converting the azimuth. The following is what I believe to be the perfect method of converting azimuths. It involves no rules to remember. It requires only a simple diagram, two thirds of which already appears on all maps. I call it the "False Line of Sight Method."

Let us continue with our G-M Angle of 15° East and our magnetic azimuth of 90°. Let's see what grid azimuth we must use to duplicate the line of sight on our map. Draw a two prong diagram representing a G-M Angle of 15° East. Always draw Grid North straight up with Magnetic North either to the East or West as required. Include the letters G.N. at the top of your Grid North line and the half arrow at the top of your Magnetic North line (Figure No. 4).

Next, add a false line of sight by drawing a line from the base of your declination diagram out to the right (See Figure No. 5B). This false line is always drawn out to the right. Draw an arc from the Magnetic North Line to the false line of sight and place the magnetic azimuth (90°) by your false line of sight (Figure No. 5C). You want the Grid Azimuth, so you say to yourself, "If I draw an arc from Grid North to

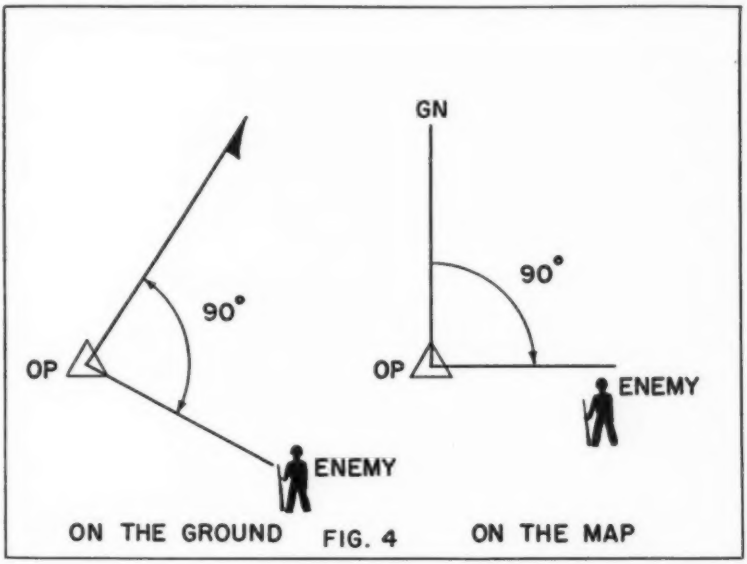


FIG. 4

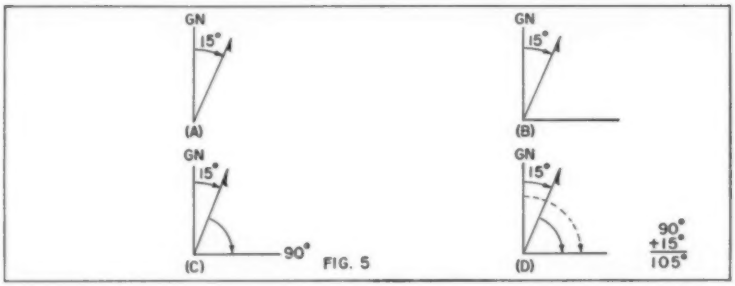


FIG. 5

my false line of sight, would it be longer or shorter than the Magnetic North arc?" Look at Figure No. 5D. You can see that if you draw an arc from Grid North to the false line of sight it would be longer than the Magnetic North arc. It would be longer by 15°. So the Grid Azimuth would be 90° + 15° or 105°.

Conversely, if you determine from your map that the Grid Azimuth from your O.P. to Hill No. 900 is 105°, what will be your Compass (Magnetic) Azimuth? Draw your declination diagram for 15° E (Figure No. 6). Add your false line of sight. You start with a Grid Azimuth this time, so draw your next arc from Grid North to your false line of sight (Figure No. 6B). Ask yourself, "If I draw an arc from Magnetic North to my false line of sight would it be longer or shorter than my Grid arc?" In this case, (Figure 6C) it would be shorter—shorter by 15°. The Magnetic Azimuth is 90°.

A West G-M Angle works the same way. Here we have a G-M Angle of 10° W (Figure No. 7A). If we have a Grid Azimuth of 270°, what would be our Magnetic Azimuth? Draw your false line of sight, then an arc from Grid North to the false line of sight (Figure No. 7B). If you draw an arc from Magnetic North to your line of sight, will it be longer or shorter? You can see that it would be longer (Figure No. 7C)—longer by 10°, giving you a Magnetic Azimuth of 280°.

That's all there is to it! To prove the simplicity of the method, here

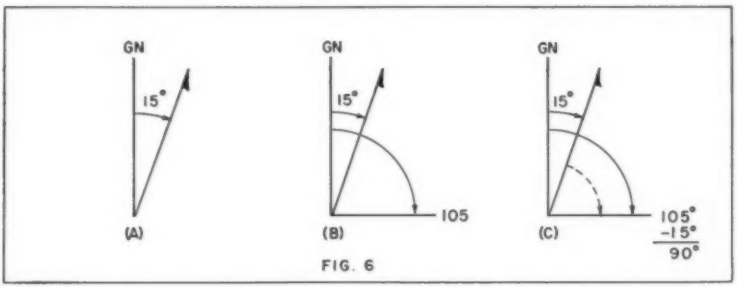


FIG. 6

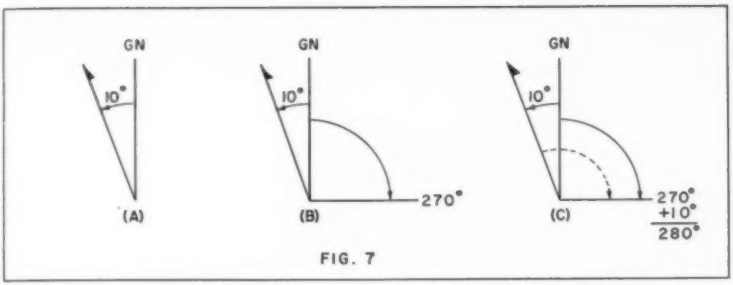


FIG. 7

is some practical work to show how easy it is to solve for the missing azimuth.

(1) G-M Angle 12° E
Grid Az 15°
Mag Az .....
(2) G-M Angle 12° E
Mag Az 25°
Grid Az .....
(3) G-M Angle 18° W
Grid Az 300°
Mag Az .....
(4) G-M Angle 18° W
Mag Az 250°
Grid Az .....
(5) G-M Angle 10° E
Mag Az 355°
Grid Az .....
(6) G-M Angle 15° W
Mag Az 5°
Grid Az .....

(Incidentally, we thought you might like to work out these problems yourself. The answers can be found on page 96).

When your students have finished this practical work, then have them try solving for the missing Azimuth by picturing the complete diagram in their head.

That's it! This is the "False Line of Sight Method" of converting Grid Azimuths to Magnetic Azimuths and vice versa. Due to its simplicity, ease of use and accuracy I feel it should become standard through the services.*

CAPT. MILES C. VAUGHAN. Our printers have learned to keep the slug "By Captain M. C. Vaughan" handy. Captain Vaughan is noted for his ability to transform ideas into practical instructing methods—point-in-proof: the above article. The author, commissioned via OCS in '44, served in Korea in '50 and '51. He is currently attending the Infantry Officers Advanced Course here at Fort Benning.

*The "False Line of Sight" Method is now used in Map Reading Instruction at The Infantry School.

Unless every man is trained beforehand in peacetime for that which he will have to accomplish in war, one has nothing but people who bear the name of a business without knowing how to practice it.

—Frederick the Great

If You Died Tomorrow . . .

What Would Happen to Your Family?

A Grim, Unpleasant, but Necessary Question!

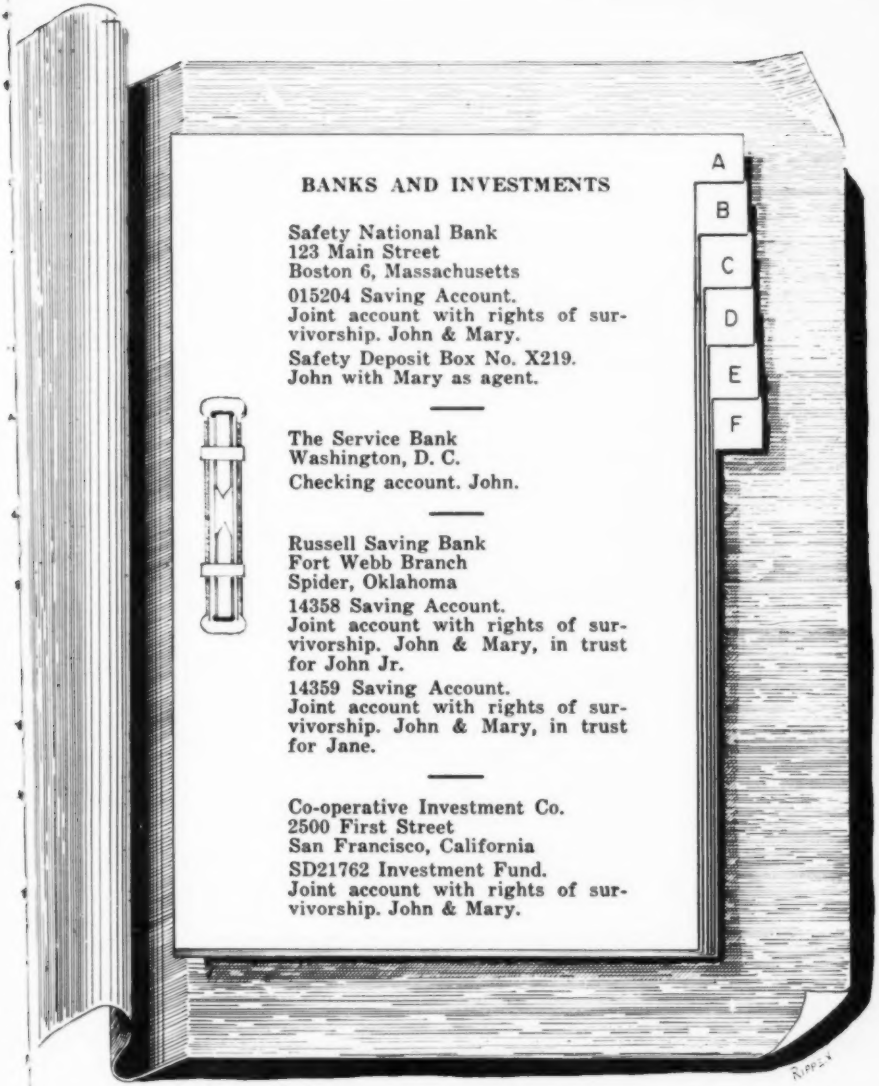
WILL THE MISSION BE COMPLETED?

Major R. V. Taibbi

THE Uniformed Services Contingency Option Act of 1953 has caused considerable discussion about a subject continually neglected by servicemen and their families. That is the problem of family security after the breadwinner has passed away. Too often, the army wife is unfamiliar, or worse, unaware of her husband's insurance program and her pension rights. This is caused, in part, by an aversion to discussing so grim a prospect as untimely death and the common misconception that the government will provide for the widow and children without any direct action on their part.

The government does provide widows' pensions and other forms of benefits but, in all cases, the pensions and benefits must be applied for by the survivors. Frequently, many dollars are lost to dependents because they are unfamiliar with their rights under the existing laws.

Since World War II, the services have published many helpful booklets designed to acquaint the soldier with



his benefits and those his family is entitled to receive when he dies. Post libraries contain a variety of books explaining the principles of insurance for the general reader. Army regulations and special regulations

are available at most unit headquarters and post headquarters. These cover thoroughly the subject of benefits and pensions.

This article is designed to outline a method of keeping your dependents informed of your estate. This can best be done by compiling a file containing all essential information pertinent to you and discussing its contents with your wife or heir. Realistic discussion and understanding can do much to prevent hardship to your family in later years. The file will be nothing more than a reference. It will be valuable only if it is kept current, reflects the situation accurately, and is understood by those it is designed to help.

Insurance is one of the biggest single investments any individual makes during his lifetime, yet many do not fully understand the insurance they own. When faced with interpreting and explaining the policies you hold, you may be surprised to find a policy bought many years ago does not fit your present or future needs.

Perhaps you have all the insurance you require or can afford. There are other considerations: (1) Are all settlements made in a lump sum? (2) Do you intend for your family to have a great amount of money at once, or do you prefer the settlements in small monthly increments? (3) Will amounts that might have been sufficient before the family grew, adequately cover the fluctuating cost of living (do the settlements include the latest members of the family, educational provisions, a relative or friend no longer qualified)? (4) Are service pensions and survivors' benefits considered in relationship to insurance settlements?

MAJ. R. V. TAIBBI. Advice, our cliché expert tells us, is cheap. Ignoring it, however, experience proves, can be expensive. For this reason, Major Taibbi's article deserves close scrutiny by every Infantryman with family obligations. The author, a veteran of WW II and Korea, is presently attending the Command and General Staff College. Until recently, he was Army Advisor to the Massachusetts National Guard.

A study of pension benefits may indicate that insurance purchased early in your career must be revised. Pension benefits are beyond your control . . . insurance is not!

When compiling the file, take time to re-evaluate your insurance program. As with every mission, prior sound planning is necessary for success.

The file will serve several purposes. To put it together will require a study of your insurance program (a task perhaps long overdue). In this way, your legatees will be informed of your plans for their welfare and of the action required on their part to claim and qualify for benefits. Your long-range mission of providing security for your family will be better served.

You can make a file with nothing more than a manila folder, paper fasteners and plain paper. (A loose-leaf notebook, though bulkier, would serve equally well.)

Here is a suggested form for setting up your file—

On the first page (A) list bank

B

C

D

E

F

GRATUITY AND ACCRUED PAY

Army will pay six months base pay to survivors of servicemen. Amount will vary with rank and years of service.

Present base pay $385.32 . . . gratuity pay at this rate = $2,311.92. Payment made in lump sum. Army Mutual Aid Association will prepare claim.*

Accrued pay is any pay already earned and not previously collected. This pay must be claimed—it will not be paid automatically.

REPORT OF DEATH AND BURIAL

Death should be reported to Commanding Officer at once. Army makes all arrangements for burial. Plot, headstone, mortician services and transportation to designated cemetery will be provided. Burial can be made in any National Cemetery or the cemetery of the post at which I'm serving should death occur. (I desire to be buried on the post I'm serving at when I die.)

TRANSPORTATION AND HOUSEHOLD GOODS

Transportation for dependents and household goods to permanent residence provided by army. Apply to nearest post headquarters Claims for lost and destroyed property must be made promptly.

COMMISSARY AND POST EXCHANGE

Apply to post headquarters for these privileges.

WILL

A copy of my will has been sent to Adjutant General for safekeeping. (Will be sent to family automatically in case of death).

INCOME TAX

Save all copies of income tax returns and allied papers. May be needed to prove taxes were paid.

DOCUMENTS

Birth and marriage certificates and all insurance policies are in safety box at Safety National Bank. Army Mutual Aid Association has certified copies of our marriage certificate and all our birth certificates.

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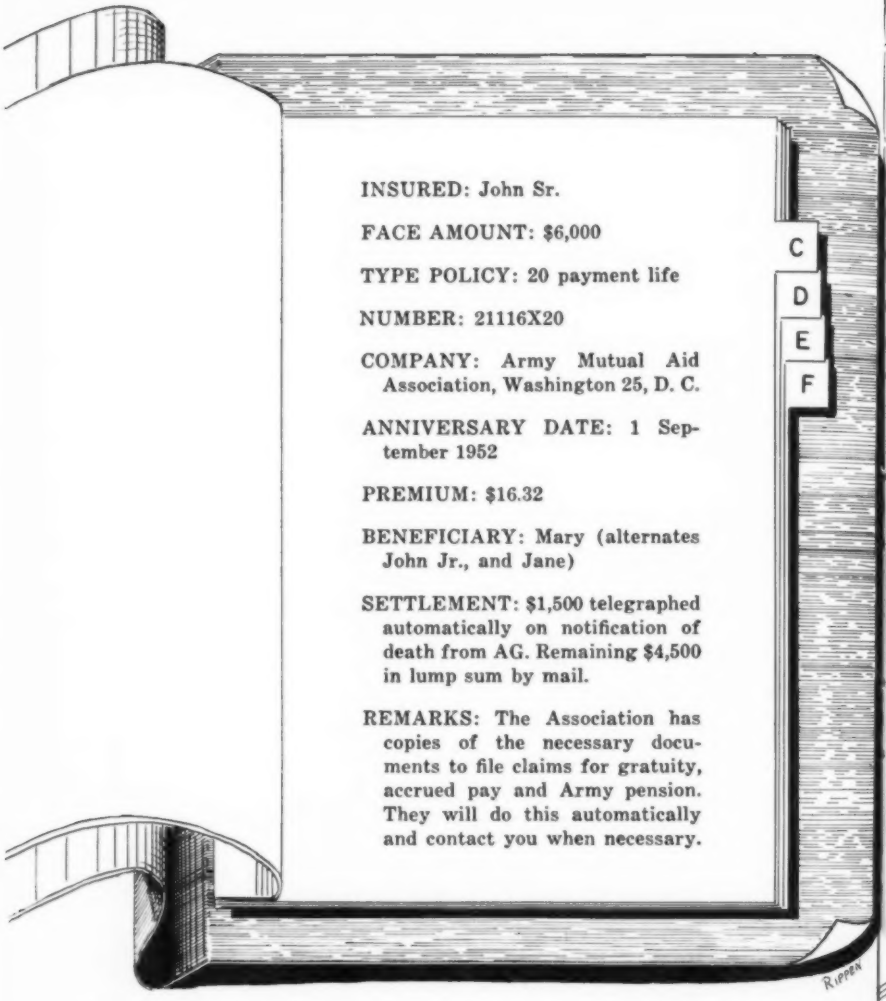
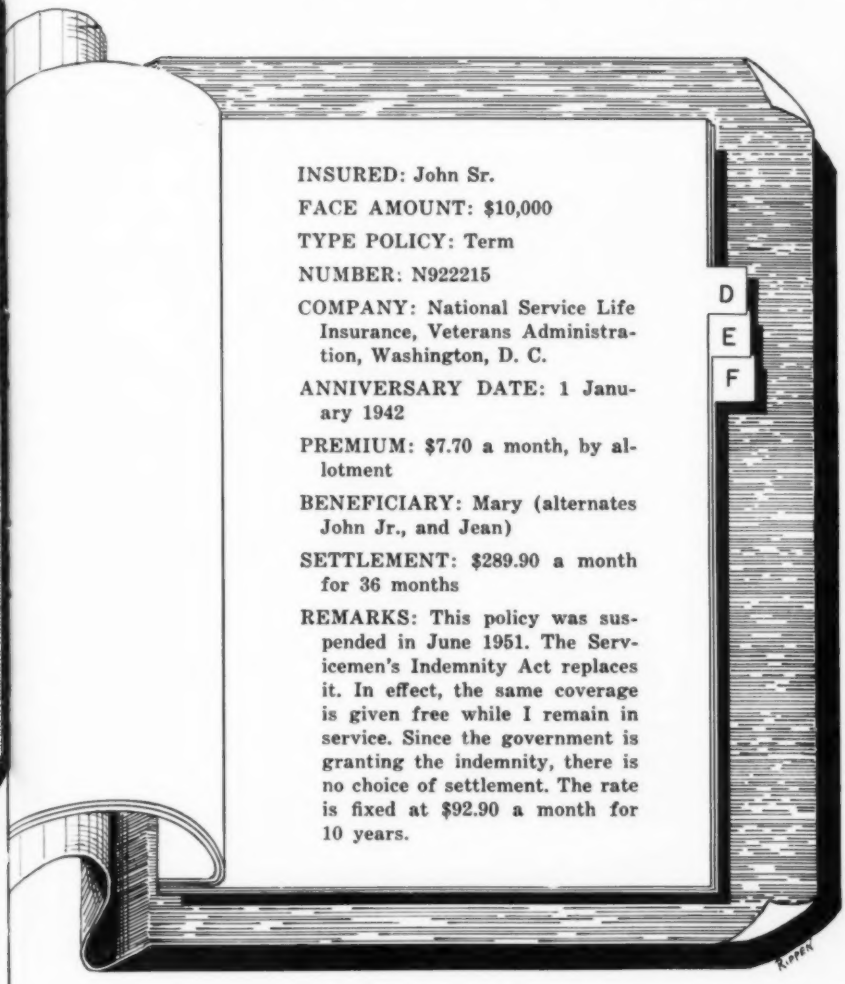
* The Army Mutual Aid Association perform this service for its members. If a lawyer or a friend has agreed to assist your family it should be stated here.

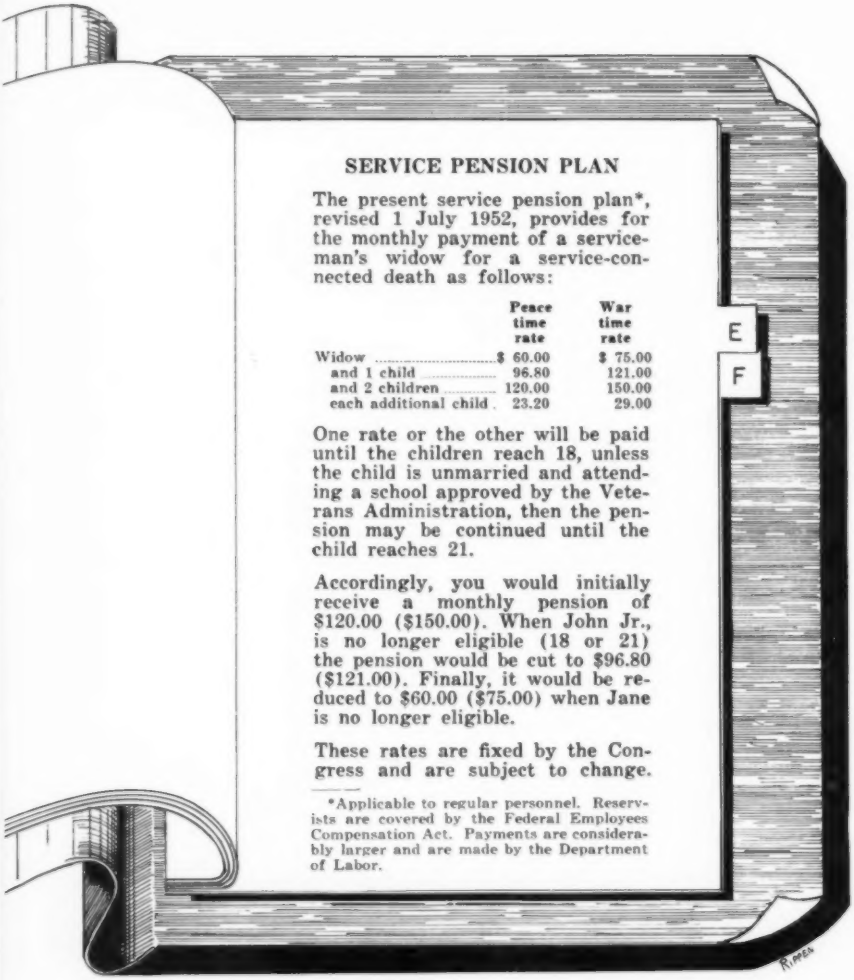

INSURED: John Sr.
FACE AMOUNT: $6,000
TYPE POLICY: 20 payment life
NUMBER: 21116X20
COMPANY: Army Mutual Aid Association, Washington 25, D. C.
ANNIVERSARY DATE: 1 September 1952
PREMIUM: $16.32
BENEFICIARY: Mary (alternates John Jr., and Jane)
SETTLEMENT: $1,500 telegraphed automatically on notification of death from AG. Remaining $4,500 in lump sum by mail.
REMARKS: The Association has copies of the necessary documents to file claims for gratuity, accrued pay and Army pension. They will do this automatically and contact you when necessary.
C
D
E
F
RIPPEN

accounts, safety deposit boxes and investments concerns. (There are thousands of unclaimed accounts in banks all over the country. Last year, the Navy Department surveyed unclaimed accounts listed by United States banks and found hundreds of unclaimed accounts belonging to naval personnel.)

On the second page (B) list

information your dependents should know about reporting death, burial instructions, accrued and gratuity pay, transportation of household goods by dependent survivors and any other information you think they might need. The information should be limited to a paragraph on each topic. Remember, the file will be used as a reference only. A separate page (C and D) for each policy has an advantage over one page list-

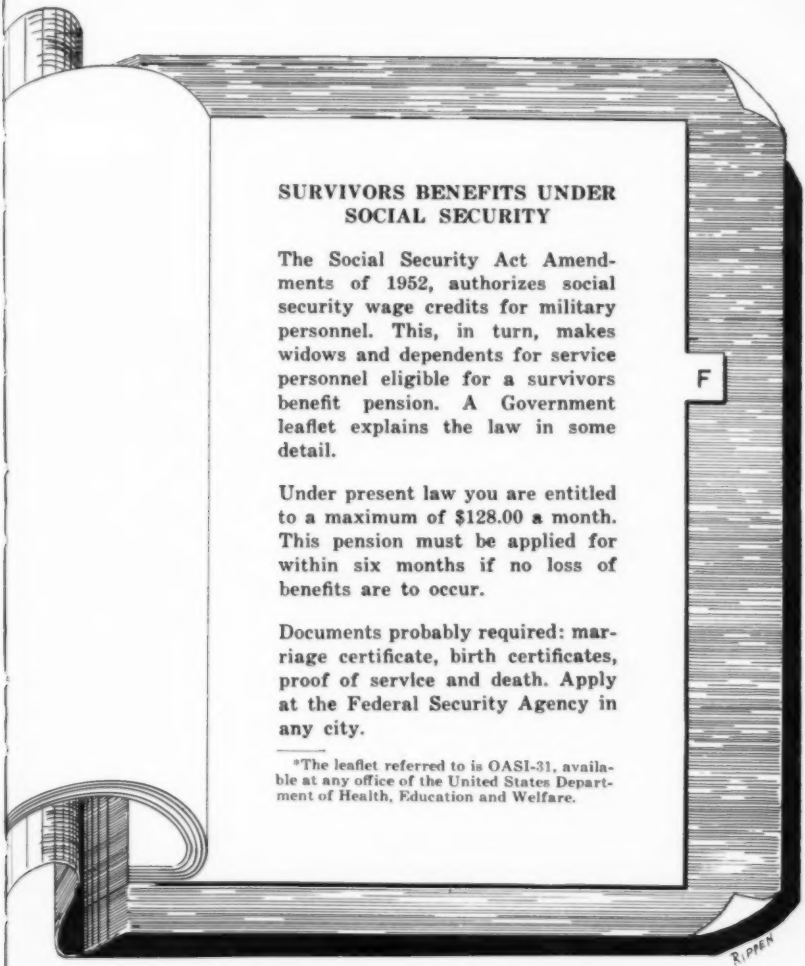

INSURED: John Sr.
FACE AMOUNT: $10,000
TYPE POLICY: Term
NUMBER: N922215
COMPANY: National Service Life Insurance, Veterans Administration, Washington, D. C.
ANNIVERSARY DATE: 1 January 1942
PREMIUM: $7.70 a month, by allotment
BENEFICIARY: Mary (alternates John Jr., and Jean)
SETTLEMENT: $289.90 a month for 36 months
REMARKS: This policy was suspended in June 1951. The Servicemen's Indemnity Act replaces it. In effect, the same coverage is given free while I remain in service. Since the government is granting the indemnity, there is no choice of settlement. The rate is fixed at $92.90 a month for 10 years.
D
E
F


SERVICE PENSION PLAN
The present service pension plan*, revised 1 July 1952, provides for the monthly payment of a serviceman's widow for a service-connected death as follows:
Peace time rate
War time rate
Widow ..... $ 60.00 $ 75.00
and 1 child 96.80 121.00
and 2 children 120.00 150.00
each additional child . 23.20 29.00
One rate or the other will be paid until the children reach 18, unless the child is unmarried and attending a school approved by the Veterans Administration, then the pension may be continued until the child reaches 21.
Accordingly, you would initially receive a monthly pension of $120.00 ($150.00). When John Jr., is no longer eligible (18 or 21) the pension would be cut to $96.80 ($121.00). Finally, it would be reduced to $60.00 ($75.00) when Jane is no longer eligible.
These rates are fixed by the Congress and are subject to change.
*Applicable to regular personnel. Reservists are covered by the Federal Employees Compensation Act. Payments are considerably larger and are made by the Department of Labor.
E
F

ing many policies. Each page will show at a glance all the main points of a particular policy and can be discarded without recopying the list of unchanged policies.

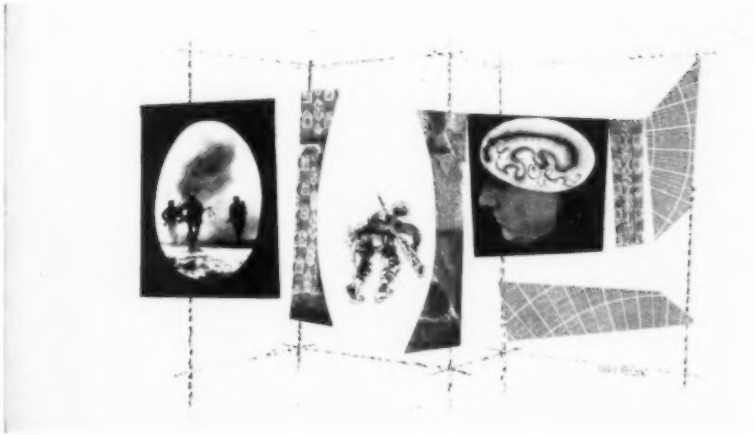
Separate pages (E and F) are also recommended for pension and benefit data, since these often change.

A page should be added reflecting your decision regarding retirement


SURVIVORS BENEFITS UNDER SOCIAL SECURITY
The Social Security Act Amendments of 1952, authorizes social security wage credits for military personnel. This, in turn, makes widows and dependents for service personnel eligible for a survivors benefit pension. A Government leaflet explains the law in some detail.
Under present law you are entitled to a maximum of $128.00 a month. This pension must be applied for within six months if no loss of benefits are to occur.
Documents probably required: marriage certificate, birth certificates, proof of service and death. Apply at the Federal Security Agency in any city.
*The leaflet referred to is OASI-31, available at any office of the United States Department of Health, Education and Welfare.
F
RIPPEN

pay after you have selected an option under the Uniformed Services Contingency Option Act of 1953. It might be well to include a negative statement, if you decide not to choose one of the options offered.

This is my plan. I've tried to make it simple and workable. After all, our primary mission as husbands and fathers is to provide for our families. Now is the time to ask yourself—"Will the Mission be Completed?"



Dr. Robert L. Egbert

profile of a fighter

WHEN in reply to political hecklers, President Lincoln said, "I can't spare this man—he fights," the President was referring to the Commanding General of one of the Union Armies in the West. But the remark of the Commander-in-Chief about General Grant might easily be echoed by any officer who has ever been in charge of a unit of combat riflemen.

Why do some men fight heroically while others cower in fear? Why does one company successfully withstand repeated enemy assaults while another is overrun in the first attack? What can we do to secure the maximum number of effective fighters for a combat unit? These and similar questions are being answered by research at Army Field Forces Human Research Unit No. 2, Fort Ord, California. The purpose of this work is to learn the differences between the effective and the ineffective combat soldier—the "fighter" and the "non-fighter."

In Korea, during the summer of 1953, a team of three psychologists interviewed groups of men actively

or recently engaged in combat. On the basis of eyewitness accounts, the psychologists selected men who had performed well in repelling the final enemy attacks and others whose performance in the same military actions was inadequate. Both groups were then tested to determine the differences between fighters and nonfighters.

The troops interviewed belonged to rifle companies that had been most heavily engaged with the enemy during the closing weeks of the Korean conflict. Included were elements of the 2nd, 7th and 45th Infantry Divisions—men who had seen action at Christmas Hill, Kumhwa Valley or Porkchop.

When each soldier was interviewed, he was asked to imagine himself in a situation similar to one he had recently experienced. If, for example, he was from Able Company of the 17th Infantry Regiment, which was the company occupying Porkchop when it was first hit on 6 July 1953, the man was asked to imagine that his position was to be assaulted by the enemy. He was asked to name the 2 or 3 men he would like to have beside him in this action, and 2 or 3 he would least like to have with him. Finally, he was requested to describe incidents from past close combat that supported his choices. In the same manner, if the soldier was being interviewed about a patrol action, he was asked to imagine he was going on patrol. The selection of good and poor fighters was based on both the nature and the number of firsthand observations reported by other men.

Descriptions of combat behavior which the experienced Infantrymen considered "good" varied from general statements about calmness under fire to specific accounts of the highest kind of daring and bravery. The "always cool" individual was not chosen for testing unless specific actions indicated that his performance was exceptional and appropriate to the situation. Here are some typical cases:

Case No. 1

A corporal from George Company (23rd Infantry Regiment) volunteered, after being hit, to help extricate a listening post force. Without a flak vest or helmet, he carried a wounded man down a hill. Intercepted by the enemy, he killed two, and continued the rest of the way with the wounded man.

Case No. 2

On the night of 18 July 1953, Baker Company (180th Infantry Regiment) held a finger of land which extended from our main battle position down toward the base of Christmas Hill. When the enemy overran some of the positions held by Baker Company, Item Company was committed to help retake the lost positions. A sergeant from Item Company was generally considered to have been the spearhead of the attack. It was stated that, among other things, he dug out two wounded men, in the face of enemy observation and fire, from a bunker in which they had barricaded themselves. Later, he helped take an enemy bunker by jumping on it and throwing in hand grenades. Then, with covering fire from other men, he leaped into the trench and covered the inside of the bunker with M-2 carbine fire.

Case No. 3

On the night of 6 July 1953, Able Company (17th Infantry Regiment) was attacked by Chinese and some of its positions were overrun. A PFC from this company went up the trench toward the Chinese with another man and set up a barbed wire block. The next morning, he and 2 other men knocked out 3 enemy-held bunkers with a 3.5" rocket launcher, which none of them had fired since basic training.

On the basis of such incidents, these men were selected as fighters.

Combat veterans also described a variety of incidents to illustrate behavior they considered inappropriate for the combat soldier. These range all the way from imagining one sees and hears things, to running from an enemy attack. For instance:

Case No. 1

In the face of enemy fire, soldier A threw down his 57mm recoilless rifle, ran away and hid in his bunker.

Case No. 2

When a flare was fired, soldier B jumped and fired into the air. On a patrol, he had the BAR and the leader could hardly keep him in position. He was jumpy and irresponsible, firing at imaginary objects.

Case No. 3

The other men in soldier C's unit had to shoot over his head to make him fire. He left, saying he couldn't take it any more. He was gone three days before the MP's picked him up.

Case No. 4

During a barrage, soldier D sat on the floor of his bunker crying. He said he couldn't fire.

Non-fighters were selected from incidents like these.

After interviews with 647 men, 345 were chosen for testing. However, since 35 were lost through early rotation, transfer, or some similar circumstances, the actual sample consisted of 310 men. The numbers of fighters and non-fighters were roughly equal.

Each of the 310 spent a week at the 45th Division Replacement Company near Ch'unch'on, completing intelligence tests, various personality inventories, a humor test, several interest blanks and a specially constructed "tell-a-story" test.* Each man filled out a life history inventory and was interviewed concerning his family background and previous experiences which might have shaped his present character. Some of the suspected differences between fighters and non-fighters have been substantiated by data, while others have not. Differences revealed by 28 personality and intelligence tests clearly distinguish the fighter from the non-fighter. In summary:

The fighter is more intelligent, uses his intelligence more effectively.

He is potentially a better leader.

He shows more masculine toughness, is less effeminate and sensitive.

He is better adjusted, emotionally more stable.

He exhibits greater social responsibility and tolerance.

*Pulse rate, body temperature, reaction time and psychogalvanic response were also measured.

The fighter is more intelligent: Intelligence tests included not only measures of mental ability, but also of the extent to which the soldier is able to use this ability effectively. The men's Aptitude Area I Scores, obtained from their Form 20s, are of great interest in this connection: the average score on Aptitude Area I was 92 for fighters and 78 for non-fighters.[1] The Military Information Test, designed to measure knowledge of material taught in basic training, is also revealing; here again, fighters' scores were considerably higher than those of non-fighters. Five other measures of intelligence and intellectual efficiency were also used.

Unfortunately, since relatively few men in either group had an Aptitude Area I score above 110, no definite statement can be made concerning the relationship between fighter-potential and high-level intelligence. Probably, the majority of the more intelligent men either become officers or receive some other specialized training rather than becoming members of a rifle squad.

The fighter has more leadership ability: Six tests relating to various aspects of leadership showed that the fighter shows greater leadership potential than the non-fighter. He is more poised, spontaneous, independent, sociable, adaptable and resourceful. Not only is he likely to be a good leader in combat, chances are he will prove a good leader in other military or civilian situations.

The fighter is more stable: The results of this study indicate that the typical fighter is better adjusted and more stable emotionally than the non-fighter. (The research revealed, however, that there were some fighters who lacked emotional stability.) According to seven tests used to measure emotional stability, the typical fighter is a mentally healthy and well-adjusted individual, while his opposite number tends to be depressed, show undue concern over his health, and exaggerate his symptoms.

The fighter is more masculine. The typical fighter appears to be more masculine in interests and attitudes than the non-fighter. He likes outdoor, manual activities, while the non-fighter prefers more passive activities.

The fighter is more socially responsible: He exhibits a higher degree of social responsibility and is more tolerant than the non-fighter. He not only is concerned about the well-being of his immediate family, but also identifies with the larger, less personal social group. He is more interested than the non-fighter in national preparedness, reducing death by accident and disease, and similar matters. He is also more tolerant of other people and their beliefs.

Thus we have a rather clear picture of the fighter as a man of balance, personal integration and resoluteness of character. Compared with the non-fighter, he is superior in intelligence, a better leader, and more mature, responsible, independent, and tolerant.

Charts A & B on page 50 graphically depict comparison of fighters and non-fighters in composite test scores.

[1] The army average is 100.

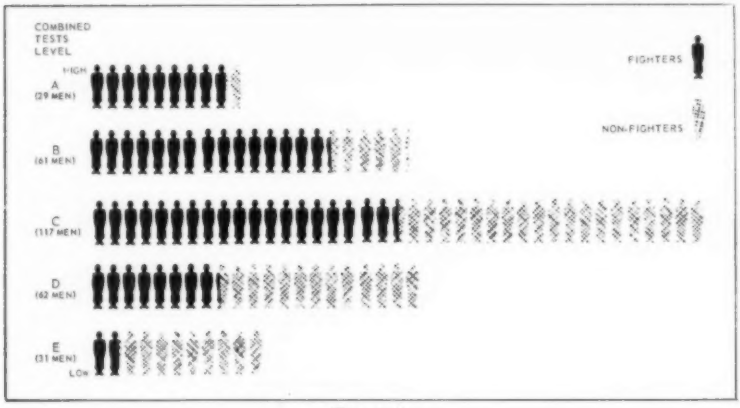


Chart A.

To indicate how clearly the tests separate fighters from non-fighters, the combined results of the 38 tests are shown in Chart A. Here the entire group of subjects has been divided into five levels, according to total score on the tests. "A" represents the highest and "E" the lowest level. It will be noted that more than 90 per cent of the men scoring at the "A" level and over 75 per cent at the "B" level were fighters,

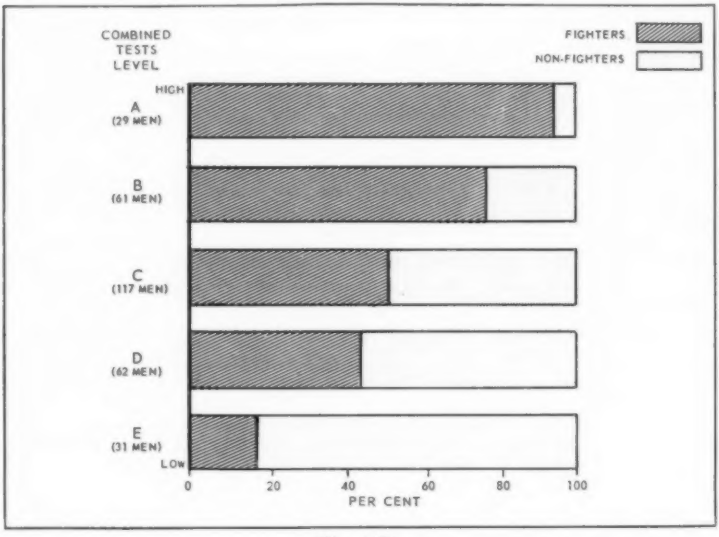


Chart B.

while fighters made up only 16 per cent of the "E" group.

The results of this research affect at least four areas of concern to the army: national manpower policy, classification and assignment, training and the composition of small Infantry combat teams such as machine-gun, flamethrower and rocket-launcher crews. To a lesser extent, the conclusions also apply to other combat arms.

The army's fighting potential will decrease when it (the army) is forced to accept men who are low in intelligence, emotional stability, maturity and the like.

Particularly in the selection of combat leaders from the squad up, primary attention should be given to choosing those who, on the basis of tests, appear most likely to do well under the stress of combat.

Although there have been non-fighters in almost every unit, considering the problems currently involved in the endless cycle of inducting, training, using them for a short period of time, and then losing them, the army is doing a most commendable job of preparing men for combat. But there are still non-fighters in almost every unit. Now that it appears possible to identify such men with reasonable accuracy, every effort should be made to develop special methods of training them.

The proportion of fighters essential to effective small-unit combat performance is yet to be determined. This is especially important in the composition of small combat teams such as machine-gun, flamethrower and mortar crews, and even larger units such as rifle platoons or rifle companies. It seems evident that fighters and non-fighters should be carefully distributed in combat units so that neither an entire weapons crew nor the major portion of a combat patrol, rifle platoon, or company is composed of potential non-fighters. Making "fighter" scores available (as Form 20 information is) to the regimental or battalion S-1 section, should permit judicious distribution of potential fighters and non-fighters.

As more research is accomplished in this area, new facts will become apparent. As these facts are incorporated in personnel and training practices, the combat effectiveness of the army will increase. The techniques of war have grown more complex and the stage of possible conflict has changed since Lincoln's day but, like him, we need the man who fights.

DR. ROBERT L. EGBERT received his Ph.D. degree in Psychology from Cornell University in 1949, after completing a tour of duty as a lieutenant, j.g., in the United States Navy during World War II. Since 1952, he has been a staff member of the Office, Chief of Army Field Forces, Human Research Unit No. 2, at Fort Ord, California, an organization whose mission is the performance of research in the areas of motivation, morale and leadership.

The opinions and conclusions expressed in this article are those of the author and should not be construed as representing those of the Department of the Army, Office, Chief of Army Field Forces or The Infantry School.—Editor

The following information provides a means of keeping up-to-date on matters of professional interest.

NEW AND APPROVED

Rifle Firing Data Card. A firing data card to replace the present scorecard has been approved.

During the past four months, this card was used by classes at The Infantry School on an experimental basis. Although the firing data card is similar in appearance to the old scorecard, there are a number of differences. The record squares for sustained fire have been changed so that they are now the same as those for slow fire. The record squares have been modified so that the "remarks" column and individual "call bulls" have been removed. A "call target" of the same size as the "hit target" has been placed next to the "hit target." This arrangement enables the firer to more easily determine the relationship between "calls" and "hits." The firer plots each shot in the call target by number, just as he plots it on the hit target. The transition table remains unchanged.

•

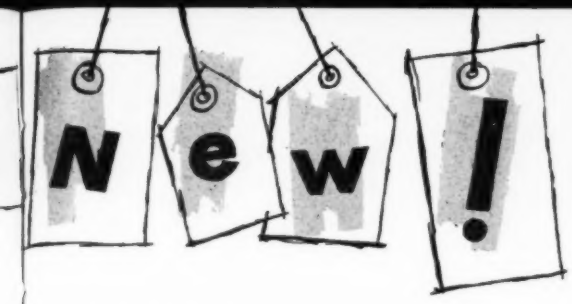
106mm Recoilless Rifle Ammunition. Ammunition is fin stabilized and does not employ a pre-engraved rotating band, which, heretofore, has been characteristic of all recoilless ammunition. Performance data of the rounds is classified but it can be said that considerable improvement over 105mm recoilless ammunition has been attained.

•

Armored Infantry Vehicle That Floats. New Infantry vehicle—the armored, tracked, M59 was developed to provide a low-cost, armored Infantry vehicle to supplement the M75, considered too expensive. The M59 provides protection for its occupants from small arms and shell fragments, and is capable of amphibious operation in calm water (up to 2 foot waves). It contains two GMC model 302 engines, two hydra-matic transmissions and a two-speed controlled differential. It is capable of speeds up to 33 mph on land and 4.3 mph in water.

TIPS

The Infantry School has canceled instruction, effective in April, 1954, on the T-7 parachute assembly. In view of the availability of the T-10 and its favored use over the earlier T-7, instructional emphasis is being devoted to the T-10 only.



DEVELOPED

Sketch Board. A Board which can be used for night reconnaissance work. To make one, cut a desired size of stiff cardboard, plywood or other suitable material and cover with luminous tape. Cover this tape with acetate and place waterproof tape around the edges of the board.

Notations can be made with a black grease pencil without the assistance of light. It has been successfully used for recording information, making road or terrain sketches, and as a map (when accurately plotted on the board prior to darkness).

•

New Field Switchboard. The new field switchboard, SB-85, is designed to greatly increase the flexibility of wire communication within an Infantry regiment or similar size unit. A retractable cord-type switchboard, the SB-86 has an operator's circuit, 16 cord circuits, 30 line terminals, night alarm, conference facilities and power ringing. It is suitable for parallel operation with other switchboard units. An additional line unit can be added, increasing the board's capacity to 60 lines. Production began in March 1954.

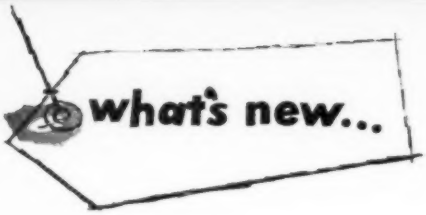
•

Suppressant Drugs. Primaquine and Chloroquine, have been standardized as malaria suppressants to replace all drugs previously used for this purpose. Chloroquine is given once weekly in malaria areas and is administered in conjunction with primaquine for a 14-day period to personnel returning to the ZI. Other drugs, notably daraprim, are being developed with the aim of ultimately eliminating malaria.

•

Artificial Respiration (Manual). Three methods of manual artificial respiration for the Armed Forces have recently been standardized. These are: (1) The Holger-Nielson (arm-lift, back pressure) method. (Preferred due to ease of administration by operator). (2) The back-pressure, hip-lift method, and (3) The Sylvester method (used in cases where the victim cannot be placed in a position to receive either of the first two methods).

All three are positive in their application of both the inhalation and exhalation phases, which greatly increases the victim's air intake and speeds ultimate recovery. Tests show that these methods bring more than three times the volume of air into a victim's lungs than older methods.



UNDER TEST

Foot Soldier's Feet. Boot soles were the subject of intensive research throughout July and August at the Yuma, Arizona, test station.

The extreme 160-degree heat of desert sand and rocks penetrating through shoes has always been a problem to the foot soldier. It is expected that the tests will result in boots that afford maximum protection for soldiers' feet.

•

Tourniquets. The present accepted practice for handling tourniquets is to leave them in place until removed by a medical officer. This is based on the assumption that all casualties receiving tourniquet treatment will be in the hands of the Army Medical Service in a matter of a few hours. It is also felt that current techniques, drugs, antibiotics and other treatment provide safety periods sufficient to prevent the loss of an extremity. This is a departure from the former method of controlling hemorrhage by intermittently releasing the tourniquet every 15-20 minutes.

UNDER STUDY

Multi-channel Radio. A new radio set, the AN/VRC-12, is being developed at the Signal Corps Laboratory. This set is designed to replace the AN/GRC-3 thru 8 series. At the present time, Armor uses AN/GRC-3 and 4, Artillery uses AN/GRC-5 and 6 and Infantry uses AN/GRC-7 and 8. The AN/VRC-12 will replace all of these sets, in that its frequency coverage (20-70 mc) will cover the entire frequency spread of all the other sets. This will allow for greater flexibility in radio communication for field force units.

•

Radiological Food Studies. Army Quartermaster Corps has started a five-year research program which may revolutionize food packing and processing.

The army will seek to develop a method of preserving foods safely by means of atomic radiation. Preliminary tests have shown that the theory is sound.

If successful, the new system would cut refrigeration needs, increase the "storage life" of foods and lessen the burdens of food storage and transportation.

•

Nine Pound Shells. The Army is presently considering the adoption of a nine pound shell for the 81mm mortars to take the place of the High Explosive Light, High Explosive Heavy and White Phosphorous rounds. This will make possible the use of a single GFT (Graphical Firing Table) which can be used in determining elevations and charges, as well as firing corrections and correction factors.

MANUALS

Revised. FM 7-24, "Communication in Infantry and Airborne Division," has been sent to higher headquarters for approval and publication. This manual is a complete revision of the old 1950 manual. The new manual is based upon the latest technical developments in radio and wire communication.

•

Revised. FM 7-30, "Service and Medical Companies, Infantry Regiment," reported in the January issue, was distributed in June.

•

Changed. Change No. 1 to TM 57-220, "Technical Training of Parachutists" has been sent to TAG for printing. This change covers arm and hand signals used with the seven jump commands, the new technique of rear door jumping with the anchor line extension kit, changes in the parachute landing falls, safety requirements when using the T-10 parachute, and a description of the new T-10 parachute.

•

Training Circular. TC-( )*, "Personnel Drops From C-124 Airplane," has been sent to TAG for printing. This circular prescribes jump techniques, tactical loading plans, airplane modifications, jump commands, and emergency procedures to be used with the C-124 type airplane.

•

Changed. "Stand Up and Fire Right"—Stop stooping . . . get those hip-fired shots right on target. **Change 1 to FM 23-5,** "U. S. Rifle, Caliber. 30, M1," just submitted to OCAFF for approval, specifies a new technique of firing from the hip. Instead of leaning forward in a low crouch with the rifle butt hanging in mid-air, those in the know how favor a more erect position with the knees only slightly bent and the rifle butt held firmly against the side of the right hip. Feet are far enough apart to insure good balance, the left foot leading enough for comfort. More hits and faster pivoting are claimed for the new technique.

Hip firing in general, according to the change, is suitable primarily for close combat, especially when the enemy can be detected only by flash, sound, or vague outline. When firing from the hip, the rifleman normally should halt long enough to squeeze the round off. In the final assault stage, however, within 30-35 yards of the enemy position, hip firing at suspected enemy locations while moving is authorized.

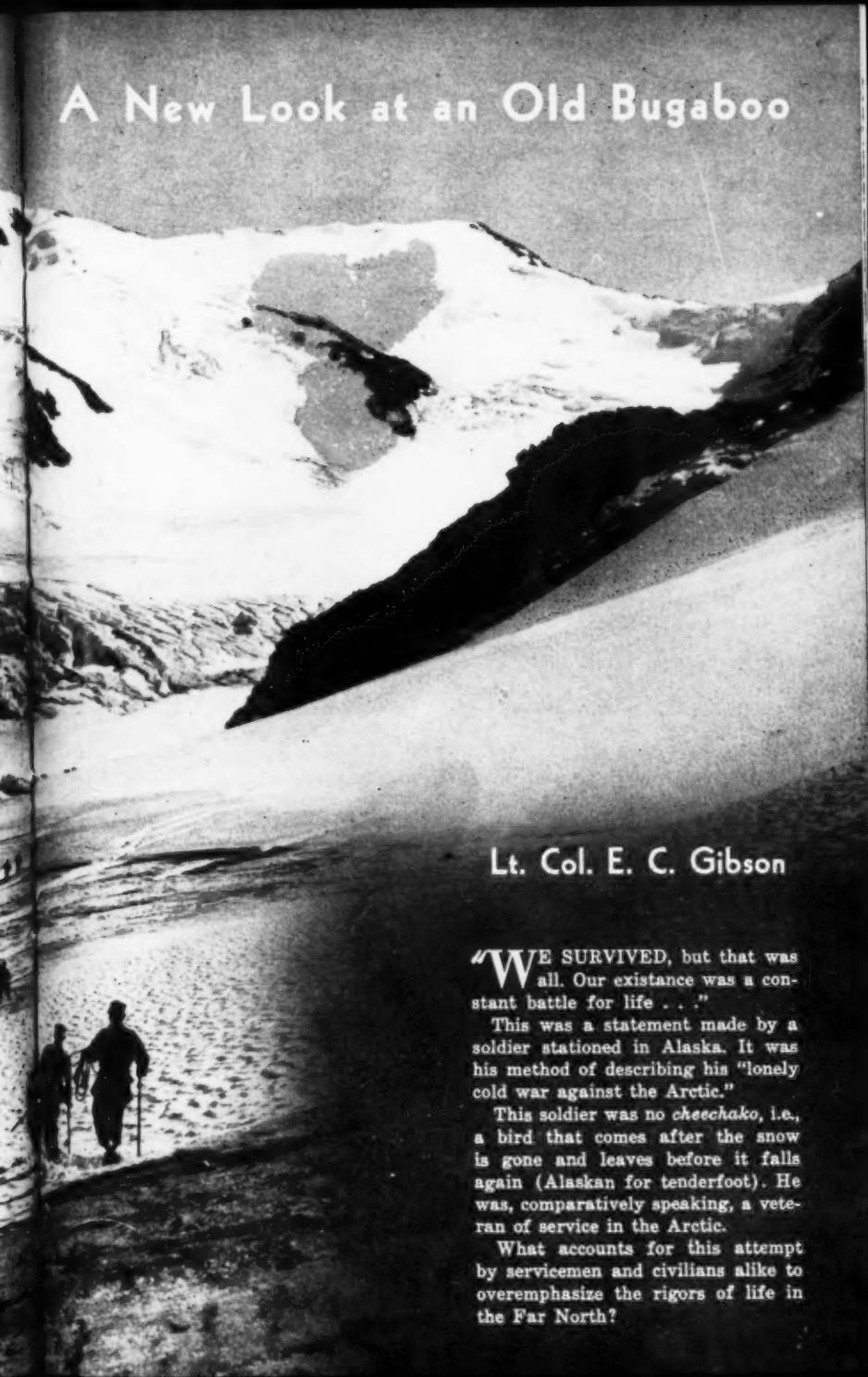
•

FM 21-11, "First Aid for Soldiers." This recently published manual incorporates the latest information on first aid procedures for soldiers. It includes not only first aid measures for "normal" emergencies and wounds but also for injuries arising from contact with such items as war gases, propellant fuels and oxidizers. It describes how to transport the sick and wounded without aggravating their condition or endangering their lives.

*(Number not yet assigned.)

THE ARCTIC . . .

A New Look at an Old Bugaboo



Lt. Col. E. C. Gibson

"WE SURVIVED, but that was all. Our existance was a constant battle for life . . ."

This was a statement made by a soldier stationed in Alaska. It was his method of describing his "lonely cold war against the Arctic."

This soldier was no *cheechako*, i.e., a bird that comes after the snow is gone and leaves before it falls again (Alaskan for tenderfoot). He was, comparatively speaking, a veteran of service in the Arctic.

What accounts for this attempt by servicemen and civilians alike to overemphasize the rigors of life in the Far North?

The fact is, most people, unfamiliar with the North, have been misled by popular fiction to assume that those in the North country are enduring great hardships. On the other hand, those new in the North, realizing the ease of self-maintenance, are reluctant to admit that their lot is neither difficult nor hazardous.

Actually, many Europeans live in a climate similar to that found in Alaska and think of it as nothing but normal. During World War II, the Russians and Germans conducted campaigns in sub-zero climes with little impairment of combat effectiveness.

There is reason to believe that men may fight in the Arctic again. In the Northern Hemisphere, air routes plotted to obtain the shortest flying distances lie extensively over arctic and sub-arctic areas. In view of the possibility that polar airlanes may be used by an aggressor as routes of approach in any future war, U. S. forces are stationed along the top of North America to warn of enemy attack, intercept an attack should it come, and deny the enemy use of our bases as stepping stones for operations against the heart of the country itself.

Because of the very nature of the army's mission, it is the soldier, more than any other serviceman, who most nearly meets the Arctic face to face and must cope with the Arctic at its worst.

To prepare for its role in defending our northern frontier, the army long ago realized that one of the first barriers to overcome was the popular illusion about the difficulties and terrors of the North.

Headquarters for the army's research and educational program for arctic warfare is Big Delta, Alaska (about 100 miles south of Fairbanks). Here the army operates the Arctic Test Branch, where testing is carried out the year round on every item of equipment that will be needed in conducting an arctic operation.

Big Delta is also the site of the Army Arctic Indoctrination School, which has the mission of providing instruction in summer and winter military operations under arctic and subarctic conditions. To this school are sent officers and NCO's from all the ground arms and services. In this school they become familiar with the problems they will encounter as well as the techniques for solving them should they ever operate in the Arctic. They are prepared psychologically for arctic operations and learn to understand the cold, rather than fear it.

After completing two intensive four-week courses of instruction, one in winter and one in summer, these men become a part of a growing reservoir of leaders which the army is building against any emergency that might arise along our northern frontier.

The average soldier goes to Alaska mainly because he has to. As he gains experience, he learns to live comfortably in the North and even to like it. He becomes confident that, if necessary, he can fight there.

From the very beginning, there are many surprises in store for him. While waiting shipment from the Seattle Port of Embarkation, he hears much scuttlebutt about the rigors of the North and the struggle for survival. Then and there his teeth begin to chatter. The experience of one such tenderfoot, a vet-

eran army sergeant on his first trip to Alaska, is typical.

THE SERGEANT'S SURPRISE. En route to Anchorage on a MATS C-54, the sergeant awoke after an all-night flight to find the plane letting down for what he supposed was a landing back at McChord Air Force Base near Seattle, from which the plane had originally taken off.

Something, he figured, had gone wrong, forcing the plane to return. Actually, the C-54 was landing on schedule at Elmendorf Field near Anchorage.

The sergeant's mistake was natural for anyone mentally prepared to land only in a country permanently locked in the grip of winter. He mistook the open water of Cook

MEET THE AUTHOR

Why did I write about the Arctic?

Because, like many soldiers who have served there, I like it. In short, I'm an Arctic enthusiast.

When I stepped off a plane at Big Delta, Alaska one day in late October 1949 to join the staff and faculty of the Army Arctic Indoctrination School (then beginning its second year of operation), I had that lost feeling one has when he arrives in a strange and isolated place. I had soldiered in the cold and snow during World War II with the 10th Mountain Division at Camp Hale, Colorado and with the 45th Infantry Division in the Vosges Mountains in France. After the war, I served with the Mountain and Winter Warfare School and Training Center at Camp Carson, Colorado. But here was something different—snow and cold in a country so vast (an area more than twice the size of Texas) and so rugged (containing Mt. McKinley, the loftiest peak in North America) that it literally took my breath away.

Despite the great advances made since 1949 in preparing our army to live and fight in the Arctic, the average soldier receiving such orders is not without apprehension. To most, the Arctic is still the great unknown.

This article was written to help acquaint the soldier with life in the North and thus prepare him for a new and exciting adventure.

Inlet for Seattle Harbor. From the air, the mountains of the Alaska Range near Anchorage looked like those of the Cascade Range in Washington. What really misled him, though, was the brightly shining sun and that except on the mountain tops, there was no snow or ice anywhere. Things looked exactly the way they had when the plane departed from the states. The fact that he was warm and sweating, as a result of the heavy emergency clothing he was wearing in the heated plane, only added to the conviction that he was stateside. If he were arriving in Alaska, he thought, he would certainly be freezing cold by now.

After landing and learning where he was, the sergeant was in a confused state for several days, but when he recovered he was well on the way to discarding one of the greatest myths about the North—i.e., that it is an unbearably cold and unpleasant place.

BANANA BELT. This incident happened in April, when the spring break-up had come throughout the Territory and especially along the southern coast. Here, due to the Japanese current, even in winter the temperature rarely drops below zero. This is the area which, because of its comparatively warm climate the year around, is condescendingly referred to as the Banana Belt by soldiers stationed elsewhere in the theater.

TEMPERATURES. Conditions in the Banana Belt are not typical of those found throughout the Territory. Even if a soldier were to spend his whole tour on the north coast of Alaska, however, he would probably never experience a temperature colder than 60 degrees below zero. In fact, the lowest temperature ever recorded on the north coast is minus 54 degrees. In any event, many soldiers come from states in the U. S. where the thermometers have dropped to 60 degrees below or lower:

Idaho:	—60 degrees
Colorado:	—60 degrees
North Dakota:	—60 degrees
Wyoming:	—63 degrees
Montana:	—66 degrees

In spite of such extreme temperatures, many soldiers grew up in these states, and eventually the majority of those who did will more than likely return to spend the rest of their lives there.

The soldier also soon discovers (thereby scotching another myth) that it does not get colder in the Arctic the farther north he goes. The subarctic interior, where, as a result of the "Heartland" concept of defense, he is most likely to be stationed, generally surpasses the Arctic proper both for cold winters and for warm summers. In the Arctic, the sea acts as a thermal damper, having a cooling effect in summer and a warming effect in winter. The subarctic interiors, on the other

Students of the Army Arctic Indoctrination School, carrying full field equipment, move cross-country in an Arctic storm.

hand, being some distance from the sea, warm rapidly in the spring and cool rapidly in the fall.

As a result, the cold center of Alaska lies not along the northern coast, but somewhere in the vicinity of Fairbanks. Temperatures in this area normally go as low as minus 50 degrees. (A low of minus 76 degrees has been recorded at Tanana, which is located in the Yukon River Valley approximately 100 miles northwest of Fairbanks.[1])

Correspondingly, this same area is the hottest in summer. The average daily maximum temperature at Fairbanks is 71 degrees, while a high of 99 degrees has been recorded. One hundred degrees in the shade (the extreme heat record for the Territory) was recorded at Fort Yukon, 100 miles to the northeast.

Though arctic winters are far from mild, they are not characterized by continuing temperatures of 50 degrees below zero. For example, at Big Delta in January 1951, which was the coldest month during Winter 1950-1951, the temperature dropped to minus 50 degrees on two days and to minus 51 (the lowest temperature recorded) only six days of the total 31.[2] On 13 days, the temperature did not drop below minus 10 and on six days it was above zero.

[1] The lowest temperature ever recorded in North America—minus 84 degrees—was at Snag, Yukon Territory, in February 1947.

[2] The previous eight year record for the month of January at Big Delta: minus 63 degrees.

Even the daily weather is characterized by extremes and rapid changes. The temperature may vary as much as 60 degrees or more within 24 hours. On 20 February, 1951 at Big Delta, for instance, the minimum temperature recorded was 31 degrees below zero; the maximum, 31 degrees above.

"WAYWARD DAUGHTER." One reason for such extremes is a phenomenon known as the Chinook Wind, often called the Wayward Daughter of the North Wind. A Chinook Wind is one that has been warmed and dried by lifting over a mountain slope, its moisture condensed out in the form of clouds and precipitation along the windward side. With very moist air, the heat resulting from condensation can provide almost unbelievable changes of temperature. At Big Delta, Chinook Winds, descending from the mountains of the Alaska Range 40 miles to the south, have been known to turn winter into spring like magic.

It came as no surprise to servicemen in Alaska when the combined Army-Navy-Air Force operation conducted during Winter 1952-1953 to test the Territory's growing defenses was called Exercise WARM-WIND. They recognized that this maneuver was named by someone who knew the Arctic well.

The greatest hazard to the soldier in the North is not temperature alone, but wind and temperature combined. A soldier gets chilled when the body surfaces cool faster than heat can be produced within. This action takes place more rapidly in windy weather and increases what is known as windchill.

A 20 mph wind with a temperature of 5 degrees will chill a man just as effectively as a 2 mph wind with a temperature of minus 40 degrees.

What happens when extremely low temperatures and high winds occur together? The answer bares the Arctic of even more of its terrors. This situation rarely, if ever, occurs. No wind has ever been recorded in Alaska when the temperature dropped to 60 degrees below zero. At such times it has always been calm.

A great deal has been written about the Arctic winds, invariably described as "paralyzing." They are not, however, such a great hazard as would first appear. The strongest winds are experienced along the coast. Even at Point Barrow, where the maximum velocity recorded was 100 mph in winter and 41 mph in summer, the average mean annual is only 12 mph.

TROOP EFFICIENCY? A question that often arises is, at what degree of temperature does the efficiency of troops begin to suffer noticeably?

Task Force Frigid was a test of men and equipment under arctic conditions conducted during winter 1946-1947 at Fairbanks, Alaska. It brought to light the fact that, given the proper equipment and providing

Wooden Igloo. Army personnel construct an experimental Finnish wooden igloo. This portable structure, now under test at Big Delta, Alaska, is designed for field use in Arctic operations.

he was well trained in its use, the American soldier can fight at temperatures as low as minus 62 degrees. It is fairly certain, though, that at some point prior to this, the effect of the cold will tend to lower the mental and physical efficiency of the individual. As a result, a greater part of a soldier's time must be spent fighting the elements. There comes a point when even the most conscientious soldier, even the most inspired leader, must look more closely after himself and less after the business of fighting. To remain effective as the temperature falls, he must rigidly observe many details not required in soldiering anywhere else on earth.

The U. S. Army is well aware that an alert, aggressive enemy may strike under even the most severe conditions and is thus preparing to meet him on any terms. In attempting operations at extremely low temperatures—no matter how urgent they may be—a certain percentage of cold casualties can be expected.

Generally speaking, the danger area where cold first begins to affect the efficiency of troops noticeably is minus 20 degrees to minus 40 degrees. This does not take into account the wind velocity, which must be considered along with temperature in planning any operation. While most soldiers would have only minor difficulty in operating efficiently on a calm day when the thermometer stood at minus 25 degrees, they would have an exceedingly difficult time if a 25 mph wind were blowing. Under these conditions, exposed flesh will freeze in one minute.

The exact point at which efficiency begins to decrease is difficult to determine since some individuals are better able to withstand the cold than others. One rule-of-thumb would assume that for every degree the thermometer drops below zero, a soldier's efficiency drops two percent. Thus, it is figured, at 50 degrees below zero a soldier's efficiency is zero. In an actual test conducted at Big Delta, however, an Infantryman dressed in the complete arctic uniform fired the automatic rifle in the prone position for three hours at minus 56 degrees without any adverse effect. There was no indication that he couldn't have continued to fire longer.

CLOTHING. The key to successful living in the Arctic lies in knowing and understanding local conditions, i.e., in working with rather than against nature.

Asked by his admiring public how he stood "the dreadful cold up there," the late Archdeacon Hudson Stuck, Alaskan traveler, author, and lecturer, used to say, "We do not endure the cold; we protect ourselves from it."[1]

The soldier's most important means of protection—his first line of defense—is his arctic uniform,

[1] "The Friendly Arctic," by Wilhjalmur Stefansson, page 606.

Gear assembled, training personnel prepare to depart from their base camp for another day of field training.

which is the best that science and industry can provide. Like the Eskimo skin clothing from which it was adapted, this uniform is designed so that it not only reduces heat loss but also, by ventilation, prevents overheating. The secret of the Eskimo clothing lies in the layers of air which are trapped between the two layers of fur and the air pockets within the fur which are warmed by the body heat. Likewise, the secret of the army uniform lies in the layers of air which are trapped between the several layers of cloth as well as by the air pockets within the fibers.

Skin clothing has never been extensively used by the army because of the difficulty and expense, if not the impossibility, of procuring furs to clothe a large force. It takes six full-sized caribou to dress an Eskimo, and there are just not enough caribou to outfit our troops the same way.

The layer principle is ideal, in that it permits the soldiers to adjust his clothing rapidly to meet a wide range of temperatures and activities. By adding or removing a layer of garments, he is able to keep the heat of his body in balance. This is a most important factor since, if his body is to operate efficiently, it must maintain a nearly constant temperature.

The Coldbar suit, which represents an entirely new concept in arctic clothing, is now undergoing intensive testing. It promises to provide an even greater degree of protection than the clothing now in standard use. Its greatest advantage is that it weighs less, while maintaining higher thermal efficiency.

WINTER DARKNESS. Next to the cold, the soldier ordered to the arctic dreads nothing more than the winter darkness. It is said to depress the spirit and force men into a gloomy sort of hibernation. Some men, according to rumor, have gone stark raving mad from its effects.

It is true that men who have time on their hands may get the "blues." However, men who are fully employed (the man who is not is hard to find) soon get used to the short days.

In midwinter, there is less than four hours of daylight at Big Delta. At Point Barrow there is no daylight during December and January. At the North Pole there is none for a total of four months.

Any idea that you have to grope around in pitch darkness is false. Although there may be no sunshine, pitch darkness is rare at any time due to the many other sources of light: the moon, which is exceedingly bright for long periods; the northern lights—sometimes only a faint glow in the sky, but often as bright as the moon; and the stars. The illumination from all these sources, plus the light reflected from the snow, makes it possible to see amazingly well. On a bright moonlight night, for example, it is easy to see a ski track shining as far as a quarter of a mile away. Colors may be recognized as far distant as 100 yards. Even during periods of maximum darkness when the sky is overcast and there is no twilight, no moon, and no northern lights—the stars project enough light through the clouds that a soldier in dark clothing 100 yards off can be spotted if he is silhouetted against a light background.

In summer there is daylight or twilight at all times. Then, far from being depressed, most people feel some degree of exhilaration from the effect of the continuous light (at least at first). At any rate, blackout curtains over the windows are an aid to falling asleep at night.

SNOWFALL. Accompanying the picture in many people's minds of a Far North continuously gripped by low temperatures, is a vision of a land buried deep in snow. Actually the Arctic is, in general, a place of little snowfall. Rainfall, too, is light. Except near the coasts, the average annual precipitation is about 10 inches. Most of the rain falls in the summer.

The average snowfall in the lowlands of the Alaskan interior is less than the average for the state of Virginia. Open plateaus and broad river valleys are often driven completely free of snow by the strong winds. In such areas it is difficult to find enough snow to construct an emergency shelter.

HEALTH. Much to his relief, the soldier soon learns that his chances of getting sick in the Arctic are no greater than in the temperate zone if he takes reasonable precautions. The secret of good health lies in prevention, not cure. Every medical disorder peculiar to operations under conditions of extreme cold—the most

Two soldiers on the trail. Note that these men wear goggles as a protection from the glare of the snow.

prominent of which are frostbite, snow blindness, and carbon monoxide poisoning — are definitely preventable.

Nevertheless, many myths have grown up about arctic ailments. One of the most ridiculous pertains to "frosted lungs"—a condition that never occurred. It is true that when a soldier exercises prodigiously at 50 degrees below zero he may feel some discomfort. His upper airway may become mildly inflamed and sore throats or hoarseness may result. In spite of this, there is no damage done to the lungs.

Take the case of the student at the Army Arctic Indoctrination School who reported to the aid station complaining of frostbitten lungs. He had just reached bivouac after a long ski march on a day when the temperature had dipped as low as minus 52 degrees. His throat was sore and so tight he could barely swallow. By asking a few questions the medic soon learned the real reason for the soldier's discomfort. It was the scalding hot coffee which he had taken during the noon break on the trail.

WEAPONS. A natural concern of every new soldier in Alaska is the performance of his weapons under

arctic winter conditions. Will they fire? The answer is yes. With minor modifications and winterization, most Infantry weapons function well if they are treated with care.

The successful employment of all weapons is dependent upon the human factor. For instance, accomplishing tasks that require manual dexterity, such as adjusting the sights of a rifle or headspace on a machine gun, is slow and tedious work while wearing heavy handgear. As a result, in extreme cold, firing will of necessity be conducted at a slower cyclic rate than it normally is elsewhere.

What about ammunition?—Its accuracy is not appreciably affected by the cold, but fuses which function on impact are usually less effective in deep snow because of its smothering action. The same is true in swampy areas during the summer because of the mud.

For years it was felt that only elite troops could meet the test of the Arctic. (Troops which, in addition to the usual requirements of the combat soldier, had such qualities as high motivation and incentive, mechanical aptitude, and previous experience with cold weather.) One school of thought even held that soldiers selected for duty in the Arctic should have come from a small community. Only with such a background, it was felt, could a soldier stand the isolated life of the North.

QUALIFICATIONS. Today, however, the army fully recognizes that any individual who is physically and mentally capable of adjusting to military life anywhere overseas, is also able to adjust to life in the Arctic. Brains are as important as brawn. Stefansson recognized this when, discussing the best material for polar explorers, he said: ". . . an educated man of diversified experience has the mental equipment to meet 'hardships.' The ignorant are fitted to meet easily only those 'hardships' that are native to them."[1]

ARMY ACHIEVEMENTS. Though most people are prone to forget it, the army is no newcomer to the North. Throughout the history of Alaska the army has played a vital role in the development of the Territory. In 1833 (34 years before Alaska was purchased from Russia by the U. S.) an army officer named Schwatka made a trip from the headwaters of the Yukon River to its mouth. This resulted in production of the first reliable map of the river. It was the forerunner of many exploratory mapping expeditions led by army officers to help open the new frontier.

Until the army built the Alaska Communication System, an exchange of messages between the U. S. and the interior of Alaska often took as long as a full year. ACS, originally known as the "Wamcats" (Washington-Alaska Military Cable and Telegraph System), still meets the main line civil and military communication requirements of the Territory. It has been in existence since 1900.

In World War II, the army was called upon to perform one of the most amazing construction feats of all time; the building, in record time, of the Alaska Highway. Work began in March 1942, and the pioneer road

[1] "The Friendly Arctic," by Vilhjalmur Stefansson, page 65.

was completed by November of the same year. With the aid of civilian contractors, it was developed into a military highway by the end of 1943.

The army's primary mission in Alaska is to protect the trails it worked so hard to blaze, but the search for new knowledge still goes on. There are many things in regard to man's ability to live and fight in the Arctic which still need study. One, for example, is the influence of arctic conditions on radio transmission and reception. Fortunately, the vast ignorance about the Arctic which has prevailed for so long is slowly disappearing.

In the meantime, the fiction lingers on. As one Alaskan soldier candidly put it: "Sure, I know this is no deep freeze, but by the time I discovered it, the folks back home had become used to that idea and were actually enjoying it. Now, . . . well you know how it is. . . . I sort of hate to let them down."

Did You Know . . . . . .

That "Tattoo," the longest bugle call, comes from the French and British, who in turn adopted it from a German Army call?

It is 28 bars long. The first eight bars are the French signal for "Lights Out," and used to be our "Taps." The next 20 bars are the British Infantry tattoo. The call is usually sounded at nine o'clock in the evening.

Back in the 17th century, the German Army tattoo was called "Zapfenstreich," meaning "Bung-line." It was the signal to end the soldiers' nightly drinking. Immediately after the call sounded, the provost and his men would go around to the beer-sellers, insure that the bungs were in the barrels, and draw a chalk line over them. If inspection next morning showed that the chalk line had been tampered with during the night, the merchant would be fined heavily. It is also said that the English version means "taps to," meaning that all beer-taps must be turned off.

Our present "Taps" was adopted during the Civil War. General Daniel Butterfield, of the Army of the Potomac, believed that the original French call did not convey a true picture of the peace and quiet of an army camp at night.

Accordingly, he composed a new "Taps" and taught it to Oliver W. Norton, the brigade bugler. It was first played in July 1862. Seventy years later, in 1932, the French Army adopted it. "Taps" is perhaps the most beautiful of all bugle calls.—Maj. Roderick A. Stamey

HIT BACK!

Maybe we're slaphappy, but we love it! We welcome comments, congratulations—yes, and criticism too! Tell us how we can improve YOUR magazine.

Lubey

here is an assault course – – designed as a field expedient to give a new and more realistic look to training with the . . .

bayonet ...

lt. paul b. malone III

NOT long ago a friend of mine spoke critically of the bayonet instruction and assault courses now being used to train our Infantrymen.

"Yes," replied another, "it's far from being superior training, but what would you do to handle the job?"

My answer was a shrug of the shoulders, but the question left me thinking. What would I do?

Shortly after that, I had an opportunity to see what I would do.

I was assigned committee chief of the Bayonet Committee of the 1st Battalion, 187th Airborne RCT stationed at Camp Wood, Kyushu, Japan. As committee chief, I had to plan four hours of instruction for each company in the battalion. The first three hours consisted of the prescribed standard bayonet instruction covering positions, movements and work with the training stick.

The fourth hour was used as a final test and practical application of

the principles taught. This was done on the assault course. Here, however, I met the difficult training situation found in Japan . . . a lack of training areas and facilities. Since the standard four-lane course was not available, I had an opportunity to develop an expedient assault course. The only usable area available was the Camp Wood parade ground; a flat grassy rectangle approximately 150 yards by 250 yards. A baseball diamond, a training aids shack, various stands and bleachers, an airborne mock-up, and two scoreboards encompassed the field. Post regulations prohibited disfiguring or digging in the area.

Working under these conditions, the Bayonet Committee prepared the field as an assault course. In this course, however, we attempted to offer every type of bayonet target and every conceivable dynamic situation that might be met by the bayonet fighter. This included targets which attacked, retreated, dodged, crawled, dropped from above and surprise-attacked from concealment. There were targets which bled, screamed and required a vigorous withdrawal. Along with these were obstacles requiring varied actions by the bayonet fighter.

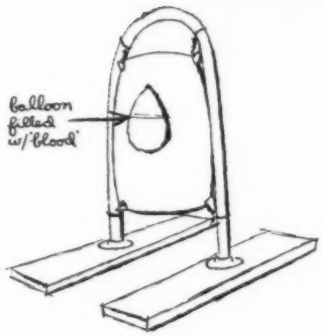
First, the Bayonet Committee coordinated with the battalion S-3 to reserve the field exclusively for five hours in one day, one hour per company. Next, materials were gathered from local sources including: Japanese produce sacks, sand bags, scrap lumber, rope, wire, straw, sand and lime. One rifle platoon was detailed to construct targets and obstacles, and was rehearsed to be used as target manipulators. A lane marked by lime was laid along the route of the course and a balloon filled with simulated "blood" was attached to each target.

Upon reporting on the day of instruction, each company was moved into an enclosed area and oriented on course rules and safety precautions. After a warning signal to the target manipulators, men were dispatched individually at 30 second intervals. As individuals approached each of the 20 targets, target manipulators attacked with their targets giving realistic sound effects. Upon completion of the 600 yard course, each man moved to the rest area in the center of the field and observed those behind him. During intervals between companies, the committee platoon repaired targets and attached new "blood" ballons on targets.

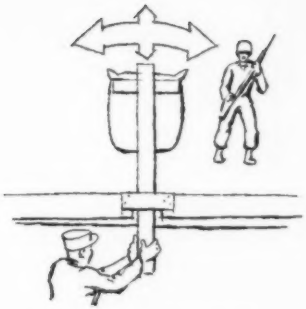
The course cost about eight dollars.

On the following pages, the targets used in this course are shown and described in detail. Also, a complete lay-out map of the assault course is presented.

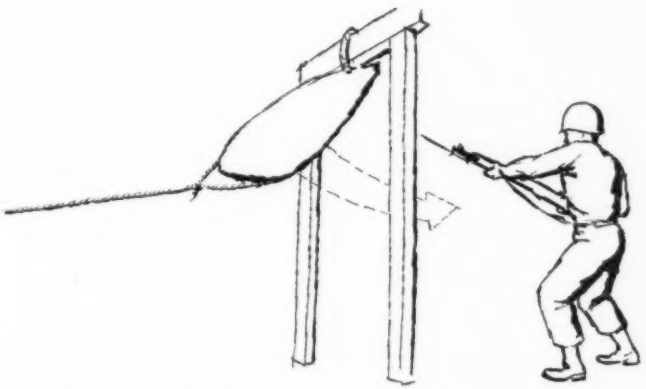
LT. PAUL B. MALONE, III, writes us that . . . "much can be done to add realism to all phases of combat training." The author, a '52 graduate of the United States Military Academy, reaches into his past experience to back up his opinion in this article. He is presently assigned to the 187th Airborne RCT.



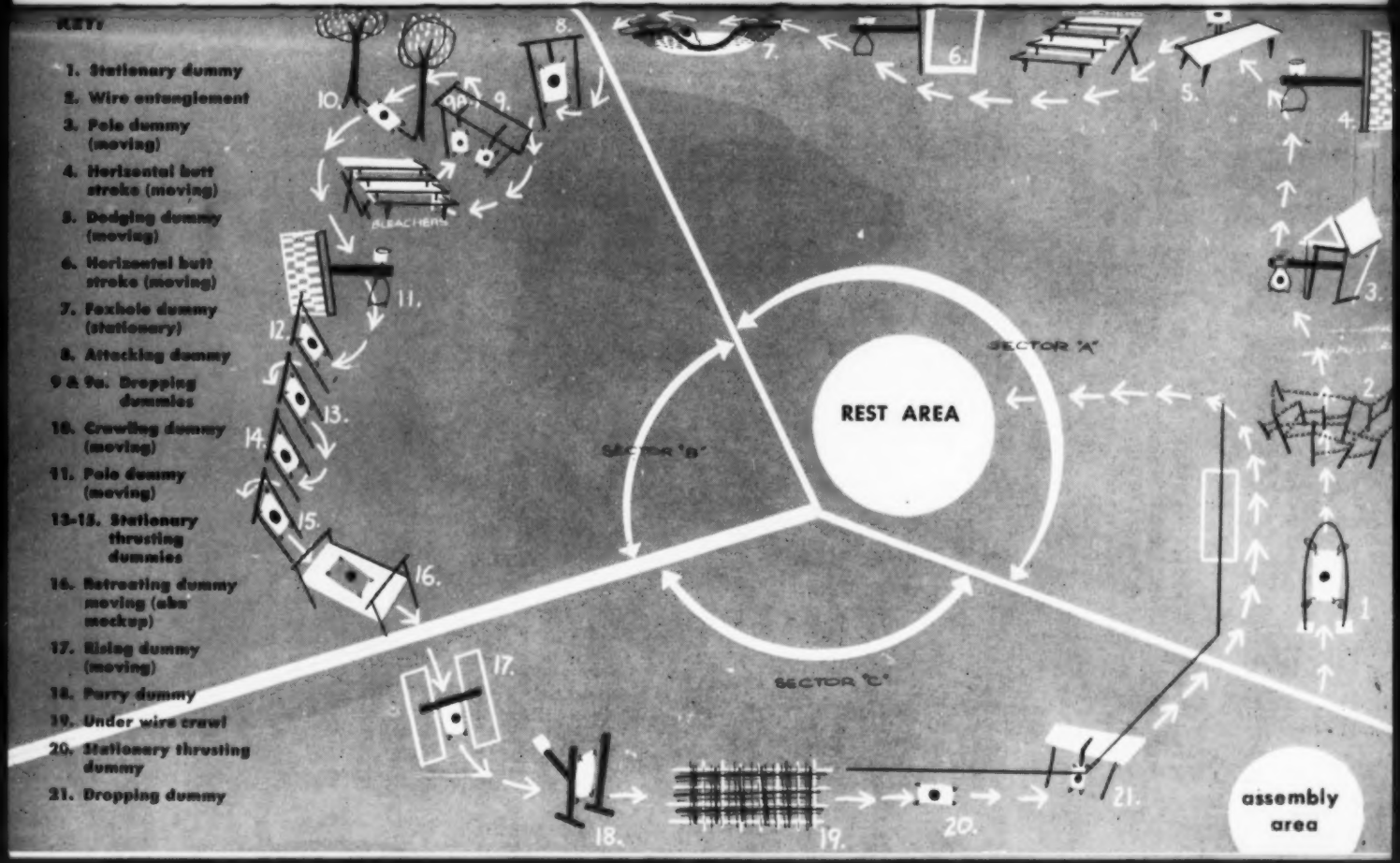
STATIONARY THRUSTING TARGET. Here the target is wired to a tubular frame made of salvaged pipe. (No manipulator is needed.)

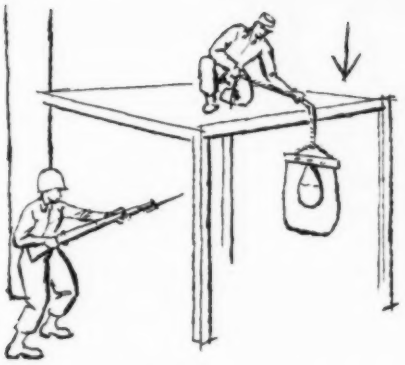


"DODGING" TARGET. The manipulator is at ground level. The bayonet fighter is on a stand above him. When the bayonet fighter begins his attack—the manipulator moves the larget laterally.

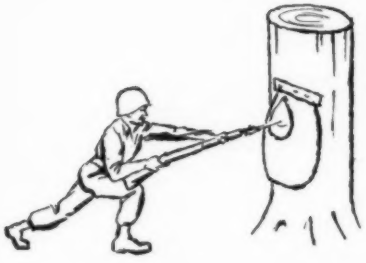


ATTACKING TARGET. This one is loaded with 100 pounds of sand. From a concealed position the manipulator pulls the rope attached to the bottom of the target until it is well back. As the bayonet fighter starts to attack, the rope is released. The weight of the target necessitates durable construction. If a man has a poor thrust—the impact will probably knock him down. (Because of the weight of this target, two manipulators should be used to operate it.)

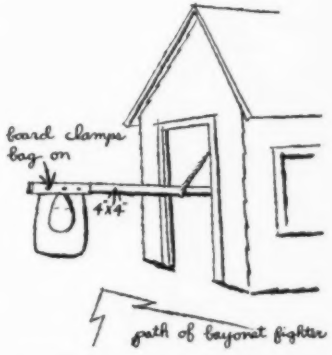

KEY:
1. Stationary dummy
2. Wire entanglement
3. Pole dummy (moving)
4. Horizontal butt stroke (moving)
5. Dodging dummy (moving)
6. Horizontal butt stroke (moving)
7. Foxhole dummy (stationary)
8. Attacking dummy
9 & 9a. Dropping dummies
10. Crawling dummy (moving)
11. Pole dummy (moving)
13-15. Stationary thrusting dummies
16. Retreating dummy moving (obs mockup)
17. Rising dummy (moving)
18. Parry dummy
19. Under wire crawl
20. Stationary thrusting dummy
21. Dropping dummy
BLEACHERS
REST AREA
SECTOR "A"
SECTOR "B"
SECTOR "C"
assembly area



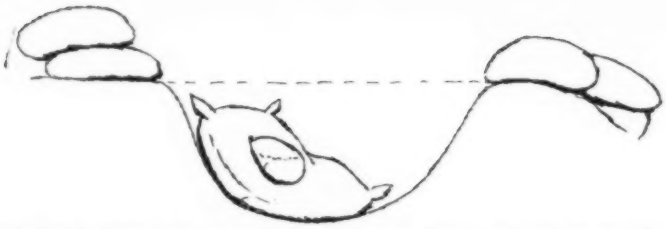
DROPPING SURPRISE TARGET. May be used singly or in pairs. The target should be dropped close to the bayonet fighter to effect complete surprise. These targets should not be too heavy if they are to be quickly withdrawn. (The manipulator should be concealed.)



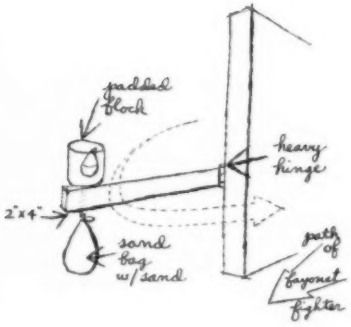
STATIONARY THRUST (difficult withdrawal). When on this target, the bayonet fighter should be directed to make a deep thrust. If this is done—the bayonet should imbed itself firmly in the wood behind the target, requiring a proper withdrawal.



SURPRISE-POLE TARGET. The manipulator is concealed in the house. He observes the bayonet fighter approaching and swings the target into view at the appropriate time. The target is composed of three burlap bags filled with straw and sand. The rope aids in supporting the pole.

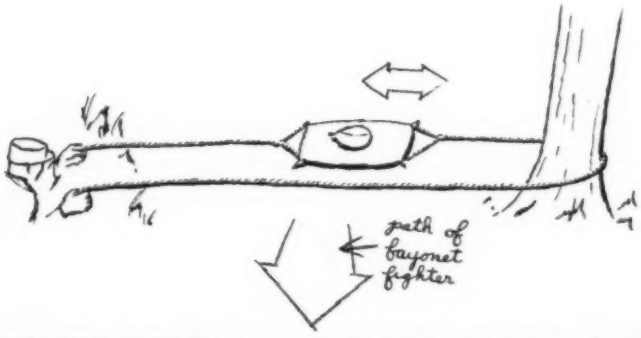


FOXHOLE TARGET. The foxhole should be large and sufficiently deep to require the bayonet fighter to jump into it in order to strike the target effectively.

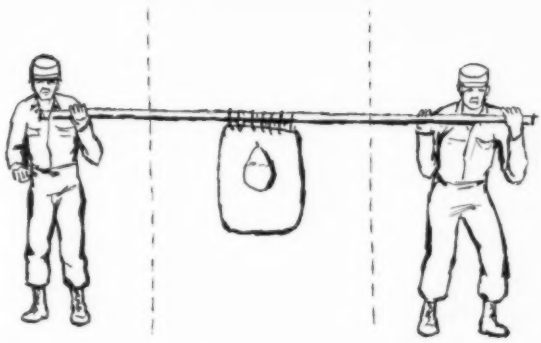


SWINGING HORIZONTAL BUTT STROKE TARGET. This target is mounted on a fence or wall. A hole is placed in the 2" x 4" board. Wire runs through this hole from the padded block to the bag, weight forming a counterbalance.

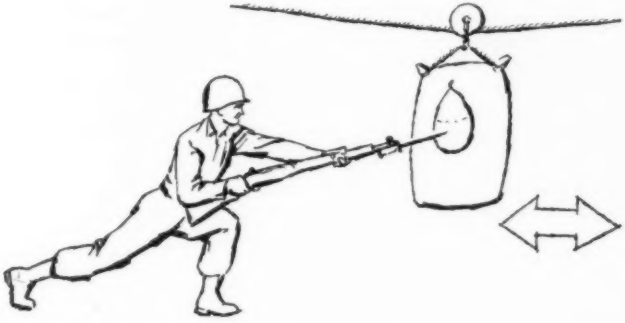
When the bayonet fighter approaches, the manipulator located behind the wall (or fence) swings the target from its concealed position.



"CRAWLING" TARGET. Ropes are attached to both ends of the target. One rope should go around a tree or post as shown. The manipulator holds the two free rope ends and moves the target laterally when it is attacked.



"JACKRABBIT" TARGET. This appears to the approaching fighter to be a stationary foxhole target. As the bayonet fighter nears it, however, the manipulators, holding the ends of the pipe or pole as shown, move rearward. These men should move rapidly and should, of course, be concealed initially.



RETREATING TARGET. Here the target is on a pulley and is operated by ropes. When attacked, it is pulled away from the fighter—requiring aggressive pursuit.

In summing up the training that can be obtained from the bayonet assault course sketched and described on the preceding pages, I believe that by using the facilities available, we were able to offer bayonet training superior to the standard-type assault course. The soldier was confronted by almost every situation and forced to react accordingly. At the conclu-

sion of the course, every participant was fatigued but the men agreed that this training was the most realistic and valuable they had ever received.

Similar courses can be prepared under many conditions employing these principles and can be used effectively to train troops in the use of the bayonet.

The next time my critical friends say, "What would you do to handle the problem?" I can answer, "I not only know what I would do, I know what I did."

Publication of this article should not necessarily be interpreted as reflecting the thought of The Infantry School or The Infantry School Quarterly.

'Star Unit' . . . the 134th Infantry

WE take pleasure in saluting the 134th Infantry Regiment of the Nebraska National Guard for being a 100 per cent subscriber to The Infantry School Quarterly.

1855! The Sault Ste Marie Canal has just been completed. Franklin Pierce is President. Blood flows in the Kansas Territory over the issues of slavery and statehood. In the Nebraska Territory, Prohibition is made law and the militia is organizing its 1st and 2nd Regiment, forerunners of the 134th Infantry Regiment.

July, 1944! Allied armies in France are grinding eastward to tear out the heart of Nazi Germany. German units dig in before St. Lo to block the advance. The 134th Infantry of the U. S. 34th Infantry Division is told to clear the way.

The regiment moves out against fierce resistance. Elements of Wehrmacht 14th Parachute Regiment and the 897th, 898th and 899th Panzer Grenadiers cling tenaciously to hedgerows and sunken roadways around Hill 122, struggling desperately to hold it. The American regiment suffers over 700 casualties but keeps attacking, bearing down, closing in—finally breaking the back of German resistance. The way to St. Lo is open. The 134th Infantry Regiment has again lived up to its motto—"All Hell Can't Stop Us."

1954! Colonel Elbert H. Smith now commands the 134th. He served during World War II as a Company Commander, Regimental S-3 and Assistant G-4 with the 35th Division and Assistant G-4 in Sixth Army Headquarters, New Guinea. Colonel Smith writes: "Each issue of The Infantry Quarterly brings us new solutions to old problems. It is an integral part of our training program."

Many thanks to you, Colonel Elbert H. Smith, and to all the officers and men of the elite 134th Infantry Regiment.

In every issue we salute an outstanding unit that has subscribed 100 per cent to The Infantry School Quarterly. Watch for the next Star Unit.

how would YOU do it ?

Capt. Gordon E. Tucker

Read the situations, study the sketch and see if you come up with Capt. Tucker's solutions to these tactical problems.—The Editor.

SITUATION

As commanding officer of Company B you know that the situation in your area is generally considered tense. You know that the combat outposts forward of your regiment were forced in by enemy action two nights ago. Battalion S-2 tells you that all intelligence reports indicate that an all-out enemy offensive can be expected in the near future. You are well aware that the front line positions have been receiving sporadic mortar and artillery fire for the past two days.

On 1 October (last night) at about 2215, your positions and those of Able Company were probed by an estimated enemy platoon. Two wounded PW's were taken by your first platoon. They were both wearing new equipment. One of the men carried a letter addressed to the 81st Aggressor Infantry Regiment.

On 2 October at 0615, (about 15 minutes before dawn) enemy supporting fires increased all along the regimental front. Intense fires fell on both Able and Baker companies' position. Local security forward of the two company areas reported an estimated enemy rifle company moving up the Chestnut Creek approach.

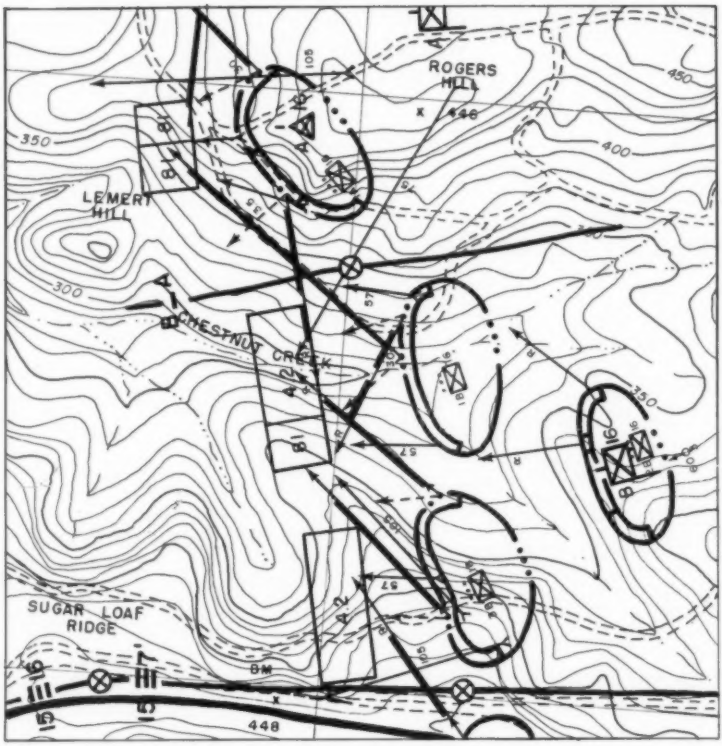
Friendly supporting fires were called in on the Chestnut Creek approach, Roger's Hill and Sugar Loaf Ridge. This was done in an effort to slow the enemy, inflict casualties and destroy the integrity of his attack.

At 0630, your company (Baker Company) was hit in force. (See Map B, page 82.)

Your front line platoon leaders called for final protective fires. You immediately requested (and received) additional supporting fires to reinforce the final protective fires along your company front.

At 0642, your 1st platoon leader reported that his left squad was overrun and that his center and right squad were engaged in close combat. Immediately following this message contact was lost with the 1st Platoon.

Lt., 3rd Platoon, reports that his men are still holding the left half of



Map A. Situation on 1 October.

the company front, in spite of continued fighting and heavy casualties. He tells you there is an estimated enemy rifle platoon in the area of the 1st Platoon and that practically all friendly resistance in that area has ceased.

A wounded rifleman from the 1st Platoon brings you the report that his platoon leader is dead and the entire platoon is lost.

Battalion S-3 calls to tell you that the enemy attack continues along the entire regimental front. He also says that Able and Easy Companies, while hard hit, remain intact.

POSSIBLE COURSES OF ACTION

It is now 0650. As Captain, Company B, which one of the following courses of action do you take?

PLAN A—Call for fires within the penetrated area, order Lt., 2d Platoon to counter-attack, and inform the battalion commander of your action.

PLAN B—Call for fires within the penetrated area, order Lt., 2d Platoon to stay in a blocking position and prevent the enemy from penetrating deeper into the defense area, and inform the Battalion Commander of your action.

DISCUSSION AND SOLUTION

In order to arrive at a sound tactical solution in a situation such as we have presented, it becomes necessary to review the principles governing the employment of a reserve platoon. To begin, let's discuss the missions it might be assigned.

1. To support the front line platoons by fire.
2. To limit penetrations.
3. To protect the company flanks and rear.
4. **Exceptionally** eject by counter-attack.

Let us concentrate on missions 2 and 4. When a front line platoon has been penetrated, the reserve platoon if properly employed, should be in a position to block the enemy advance. In most cases, this is best. We may, however, employ the reserve platoon as a counter-attack force if the conditions listed below are satisfied:

1. A small penetration has been made (usually a squad or less).
2. The enemy has lost the initiative.
3. The enemy is not being reinforced.
4. When fire alone has failed to eject the enemy.

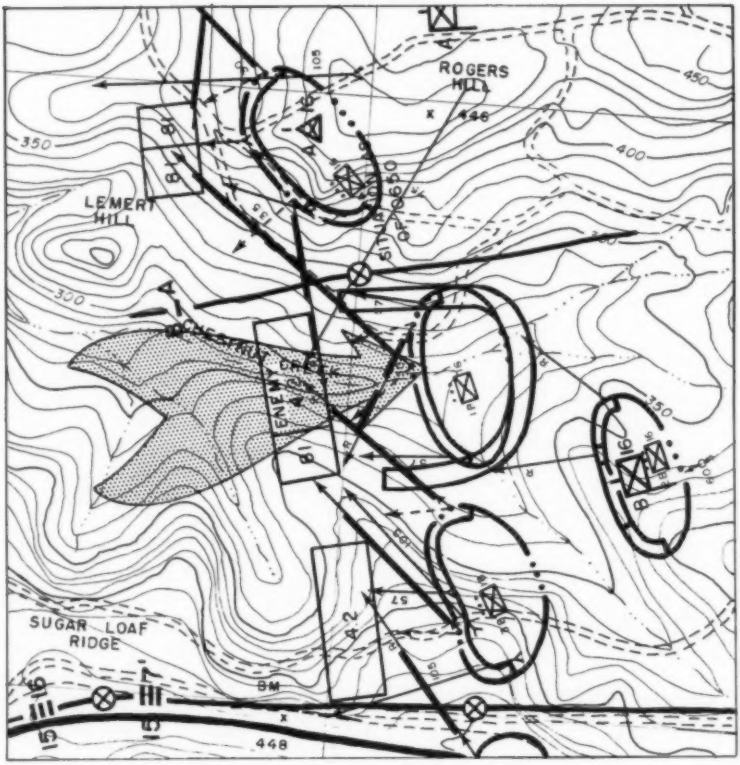
We find that the defender, when planning a counter-attack, assures himself of success. If his reserve is not of sufficient strength to successfully counter-attack, he employs it in a blocking role and leaves the decision to counter-attack to the next higher commander.

Now examine the situation presented. Note how the principles enumerated apply. All indications are that the entire right front line platoon of Baker Company is overrun. It follows that an enemy possessing sufficient strength to overrun a prepared platoon defensive position has the power to resist the efforts of a platoon size counter-attack force. The weighted attack in the area of the 1st Battalion (as well as the continued attack along the entire regimental front) indicates a determined effort to effect a penetration in this location. The reserve platoon, Company B, can be used most advantageously in a blocking role to prevent the enemy from penetrating more deeply into the battle position.

When all of these factors are taken into consideration, it becomes apparent that the mission of counter-

---

CAPT. GORDON E. TUCKER. The author is highly qualified to offer us a platoon-level problem. He received a direct commission in 1946 and served as a platoon leader, exec officer and company commander with the 7th Cavalry in Korea. Captain Tucker is a graduate of the Associate Advanced Course of The Infantry School and is presently an instructor in the Tactical Department, The Infantry School.



Map B. At 0630 Baker Company was hit in force.

attacking should logically be left to a larger unit. The battalion commander, in this case, will probably order his reserve company to counter-attack and restore the battle position. For all of the reasons given, Plan B is considered more desirable.

Plan A is poor when one views it in light of the superiority of the penetrating force. Were the reserve platoon to counter-attack, it would probably not only fail to restore the battle position, but would permit the enemy to penetrate deeper into the battle position. If used as a counter-attacking force, it must leave its blocking position. The latter would sacrifice the company's organization in depth.

DREAMS

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PLACE:

The patio of the Oakmont Country Club, Pittsburgh, Penna.

TIME:

Mid-summer, this year.

CHARACTERS:

Frank Blackmore, midwest sporting goods manufacturer, former WW II company commander and past Ohio State University football great.

His guests: Brigadier Christopher Harcourte (British Army, Ret.) War-time friend of Blackmore, in the U. S. on a business trip. **Clarke McLaughlin,** sports columnist for the Edinburgh Scotsman and former officer in the famous "Black Watch Brigade." He is in Pittsburgh representing the British Golf Association. **Colonel Jesse T. Nesbitt,** a company commander in the early days of WW II. Currently PMS &T at Westbury State Teachers College. A long time friend of the host.

SETTING:

It is the final round of the Ryder Cup Golf Matches. Frank Blackmore and his guests have just finished the back-nine and are awaiting the start of the golf contest. As the story opens, the foursome has just been seated at a patio table which overlooks the first tee.

AMBUSH

"SEE that dog-leg to the right about 250 yards down the fairway? Sure would be an excellent spot for an ambush, wouldn't it?" said Col. Nesbitt.

"Can't you forget the army once in a while, Jess?" said Frank Blackmore.

"Sorry, Frank," answered the Colonel, thinking out loud, "but you must admit with woods on either side of that bend, a foot column passing through there would be ready prey for ambush."

"Strange you should mention ambush, Nesbitt," said Brigadier Harcourte as he stared at the spot Colonel Nesbitt had pointed out.

"Nearly got mine in an ambush back in '42," he continued.

"I'd like to hear about it," replied the Colonel. "I have a class coming up on ambush. Maybe you have a story I can use." "Glad to," said the Brigadier as he relaxed and began to talk. "It happened in Burma in July 1942. I was with the 6th Brigade of the 2d British Division and as I remember, I was a Captain at the time. Things were disgustingly bad for us . . . we had had a rotten streak of luck.

"Let's see," the Englishman paused, "it happened late one afternoon. The heat was unbearable as usual, and that confounded rain had

A Story by Major George Tassey and Capt. Gordon J. Jung

Suddenly, as we neared

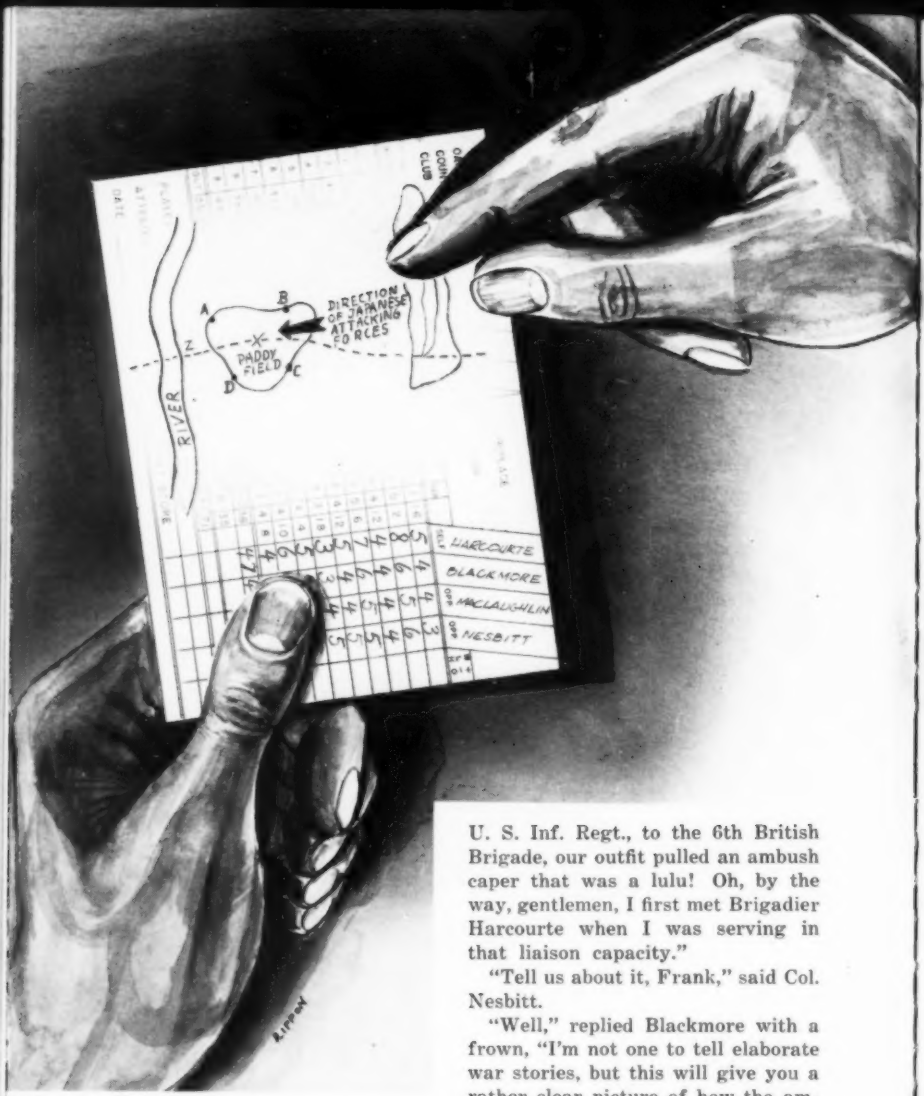
...he center of the clearing . .

just stopped. Everywhere you looked, steam was rising from the ground. My rifle company was pursuing a Japanese force along a small, winding trail. The advance guard had reached a bend in the trail and observed a comparatively straight path for about 150 yards. The trail followed an old stream bed, which formed a clearing about 60 feet wide. The advance guard examined the edge of the clearing for signs of the enemy and found nothing. After lying in silence for a few minutes, they notified the main body to move forward. Suddenly, as we neared the center of the clearing, enemy machine guns, which had been carefully concealed in the trees at both ends of the clearing, opened fire.

"Taken by surprise, my troops immediately headed for the cover of the jungle but were met by the Japanese ambush party armed with knives. Many of my men were killed and many more suffered severe slashes on the arms and shoulders. In the confusion which followed, the Japanese succeeded in escaping. The casualties numbered about 40 per cent of the company." He paused, and then continued, "I shall never forget the heroic action of Lance Corporal Oliver Head, who single-handed knocked out two enemy machine guns. Had it not been for him, the casualty rate would most certainly have been higher."

The Brigadier rubbed his brow as he thought for a moment.

"We were very lucky to get out of that show alive. Those Japanese certainly pulled a well-laid, well-executed ambush."



"They were clever at pulling an ambush but were also quite vulnerable to the ambush themselves," said Frank Blackmore as he shifted the position of his chair.

"In 1944, just before I was assigned liaison officer from the 475th U. S. Inf. Regt., to the 6th British Brigade, our outfit pulled an ambush caper that was a lulu! Oh, by the way, gentlemen, I first met Brigadier Harcourte when I was serving in that liaison capacity."

"Tell us about it, Frank," said Col. Nesbitt.

"Well," replied Blackmore with a frown, "I'm not one to tell elaborate war stories, but this will give you a rather clear picture of how the ambush can work against a master of the art."

"I think I'll have an ambush story you might be wanting to hear," interrupted restless Clarke MacLaughlin. "Of course," he added, "after Mr. Blackmore finishes."

Blackmore continued, "As I said, it was the summer of '44 and we were beginning to make the Japanese uneasy. The 475th was holding a river line at the time, and my company controlled the path that lead to the only ford in the general area."

Blackmore hesitated and then stuck out his hand toward Col. Nesbitt.

"Say, Jesse," he said, "give me that scorecard you kept for the back nine. I can give you a better idea of how this ambush worked if I draw a little diagram.

(See drawing on opposite page.)

"There," said Frank with sort of a half-smile on his face when he finished writing. "This will give you a rough idea of the situation."

He pushed his chair closer to MacLaughlin and continued his story as he held the scorecard in front of his audience.

"I had sent a patrol out along the path and told them to go down the road for several miles to see if they could discover what the enemy was up to. They came back with the word that at least a re-inforced company was moving in our direction along the path."

Blackmore pounded his fingers on the table as he said, "It was my belief that they were going to assault our position in an attempt to retake the river position. In order to get to our position, they had to pass directly through a paddy field. A platoon of my men assumed position X." He marked the point on the sketch with his pencil. "The Japanese," he continued, "moved into attack as the arrow indicates. Our force at point X withdrew in face of the attacking troops. Encountering no opposition, the attacking troops burst into the clearing and headed for the opposite side to engage our deceptive platoon which had taken up a position at Z."

A gleam came into Blackmore's eyes as he talked. "When the Japanese were well into the clearing, our machine guns situated in trees at A, B, C & D opened fire and caught the attackers in a deadly crossfire. We completely annihilated the company, except for 14 prisoners that were taken."

"Must have been a jolly good show, Frank," said Brigadier Harcourte.

"Yes, Blackmore," commented the reticent MacLaughlin, "a well-planned and executed ambush." "It wasn't a massive operation," Frank said, "but it proved to me that the ambush is a mighty important offensive tactic."

"It's certainly well-worth knowing something about," said Colonel Nesbitt nodding approval to Frank's story.

"I'll agree," added Brigadier Harcourte.

Not far away, the public address announcer was introducing the Ryder Cup participants.

"Your attention please, your attention please. At the end of five holes, Hogan, USA, 2 up on Sir John Hardy, Great Britain and Snead, USA, 1 up on Cameron, Great Britain."

"Now, Mac, old man," said Brigadier Harcourte, "I say, isn't it about time we heard that ambush example you were going to tell us?"

"Very well," answered MacLaughlin.

"When the war started with the Germans, I was assigned a Lieutenant with the Black Watch Regiment, Original 51st Highland Division. "Well," MacLaughlin continued, "our division was soundly routed at St. Valery in 1940.

"Not long after that, the 51st Highland Division was reorganized. I was assigned to the 7th Black Watch Regiment, 154th Brigade. We had fought across North Africa and were engaging the enemy in Sicily at the time this incident took place."

"Hello," interrupted Brigadier Harcourte, "here we are."

A waiter placed drinks on the table, while MacLaughlin removed a burlwood pipe from the pocket of his rough tweed jacket and tamped in some tobacco.

"Will that be all, gentlemen?" said the waiter.

"I think so," answered Frank.

"Just a second, son," said Colonel Nesbitt as the waiter turned to walk away, "could you bring me a sheet of writing paper?"

"Yes, sir."

"OK, Mac," blurted Brigadier Harcourte, "on with the story."

"As I was saying," the Scotsman said, "the ambush took place in Sicily.

"A company size unit of the 7th Black Watch was holding some ground about 100 yards from a group of small lakes."

As MacLaughlin talked, he sketched a rough diagram on the paper napkin that lay in front of him.

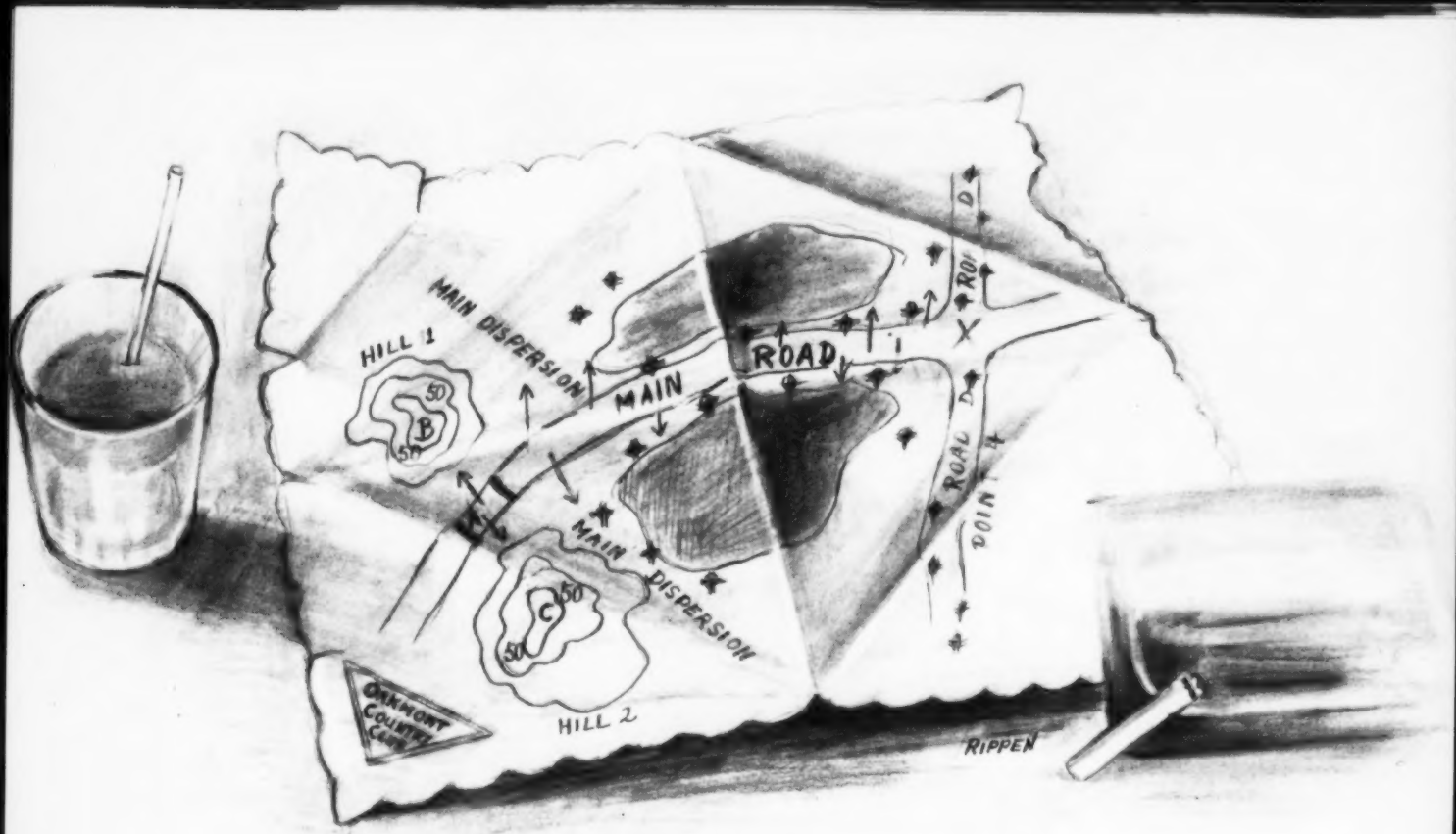
(See drawing on opposite page.)

"A small piece of land with a road," he continued, "ran between two of these finger lakes. On our side of the lakes," (he stopped long enough to point out hills 1 and 2), "there were small hills on either side of the road. At least a regiment of the enemy, which had been cut-off from their unit, was advancing in our direction using this road. A road block was placed at point A and machine guns, automatic weapons and mortars at points B and C, with mortars behind hills 1 and 2. Our mortars were zeroed in at road junction X. The lake shores were mined as was road D at points 3 and 4. When the enemy troops reached the road block that had been constructed, we opened up with a heavy volume of fire. At once the enemy became confused. They dispersed as these broken arrows indicate." MacLaughlin hurriedly ran his fingers over the areas he described, then resumed his story. "The mortars started to fire on the road junction and land mines were taking a heavy toll. In less than 30 minutes the regiment was destroyed and those not killed or wounded, surrendered."

The Scotsman reached for his half-empty glass. "I might add," he said, "we lost but two men."

"Another example of an excellent ambush," spoke the Brigadier.

MAJ. GEORGE TASSEY. A WW II veteran, the co-author also served in Korea with the 2nd Division. He joined the Ranger Training Command upon his return to the states in '51. At present, he is the executive officer of the Coordinating Group of the Ranger Department at The Infantry School.


HILL 1
MAIN DISPERSION
MAIN
ROAD
ROAD
MAIN
DISPERSION
HILL 2
RIPPEN

"Fine," said the Colonel, "Fine."

"It was a well-planned operation," boasted MacLaughlin, "if I say so myself."

Just then the waiter returned with several sheets of paper, inquired if he could be of further service, departed.

"All right, Jesse," said Blackmore, "how about an ambush yarn from you?"

"I don't believe mine are in the same category with the ones we've heard," answered Col. Nesbitt. "I'm afraid that mine wouldn't prove too interesting."

"He always was a modest chap," remarked Blackmore, "except when there was a beautiful lady around to impress. What a line he had then!"

"I believe you're jealous, Frank," replied Nesbitt.

The P.A. announcer came to the rescue.

"Your attention please, your attention please. On the tee, E. S. 'Dutch' Harrison, Ardmore, Oklahoma."

"Should be getting some word about those other lads soon," said the Brigadier.

"Getting back to the ambush topic for a minute," said Colonel Nesbitt, "I'd like to have a list of the important points that must be considered when planning and executing an ambush. How about giving me your assistance?"

"Glad to, Colonel," replied Brigadier Harcourte.

"OK, Jesse," was Blackmore's reply.

"MacLaughlin," said Colonel Nesbitt, "suppose you give us an important point, and then we'll go right around the table."

The Scot speculated for a moment and spoke.

"Gentlemen," he said, rubbing his chin, "I believe the most important thing to remember is that an ambush is successful only when it comes as a complete surprise. Also, an ambush must have a reserve, to take advantage of favorable opportunities and to deal with the unexpected. Always keep in mind that no one ambush will ever be exactly like another. A leader preparing an ambush must always satisfy himself that the move will be a profitable one . . . then," said the Scotsman with a look of determination, "he must consider all the possible factors and make the necessary plans."

"Is that good enough, Col. Nesbitt?" asked Mac.

"That's fine," nodded the Colonel, who was busy writing down what had just been said.

As he finished writing, he raised his head, "All right, who's next?"

"Well," replied Brigadier Harcourte, "I'll give it a go."

The Brigadier pulled a white handkerchief from his pocket and wiped his forehead as he began to speak.

"The commander charged with the responsibility of executing an ambush must have a thorough working knowledge of the enemy with regard to his contemplated action upon entering a likely ambush sector. Also, care must be exercised to provide for likely enemy countermeasures, which might be either of a harassing or determined nature."

"For example," the Brigadier continued, "in World War II, Japanese reaction to an ambush was remarkably predictable. First, they would always get their leading elements off the road or trail and attempt an outflanking movement. Second, they would invariably bring their mortars into action (they nearly always had a mortar with them) with the least possible delay, and subsequently attack astride the trail and general area in which the ambush had been prepared. This sometimes took place after a lapse of no more than five minutes."

Harcourte hesitated for a few seconds, then continued talking.

"It follows," he said, "that if arrangements had not been made to the contrary, the Japanese would always have been left in possession of the battlefield and would have disposed of our wounded, collected their own, and prevented us from getting some kind of identification. I should say that any plan for laying an ambush should make provisions to remain in at least temporary possession of the battlefield.

"When an ambush takes place and a fight follows, there is bound to be a certain degree of confusion. For this reason, a rendezvous for the ambushing party is essential. It may take some hours before the entire ambushing party can assemble at the rendezvous. Therefore, if you are to take advantage of the situation during the period of confusion, it is clear, as MacLaughlin pointed out, that reserves are necessary and should be brought into action and boldly handled."

MacLaughlin's lips formed a fleeting smile of approval as Brigadier Harcourte turned toward Frank Blackmore.

"How about hearing from you, Blackmore, old man," the Englishman said as he inspected the icy remains of his drink.

"Yes, Frank," remarked Colonel Nesbitt, "I am sure you have a good

point or two."

"Well gentlemen," Blackmore began, "to continue on this matter about reserves, the relative strengths of the ambushing party and its reserve depend largely on the mission. If the mission is merely to cause confusion, the actual ambushing party may be very small indeed; possibly just a leader and two men. On the other hand, if it is known that a large number are about to be ambushed—more, in fact, than could be dealt with by a very small ambush party—the ambush party will have to be proportionately stronger, and he subdivided into two, three or more groups.

"The command to open fire, I believe, is one of the most important factors contributing to a successful ambush. The command to open fire must be given only by the commander of the ambush party. His position usually should be in a place from which he can observe how many 'rats' have entered the trap before he gives the command to commence firing."

As Blackmore finished talking, the public address announcer said, "Your attention please.

"Ben Hogan has just won the 15th hole in his match with Sir John Hardy and takes the match 4 and 3 . . ."

The announcer was running through the rest of the field as Colonel Nesbit attempted to get the attention of his small group.

"Gentlemen," said the Colonel, "while you were talking I wrote down several things I consider important in conducting an ambush. I'd like to see if you agree with me. All right?"

"Fine, Jesse," replied Blackmore, "glad to listen."

"Fire when ready, old man," added the Englishman.

"The first thing I have listed here," the Colonel began, "is under the heading, review of camouflage discipline. I believe it is not enough to assume that each man has had adequate training in camouflage. The commander concerned with an ambush must insure that troops participating in the ambush are thoroughly instructed in strict camouflage techniques. One man breaching camouflage discipline can very easily ruin a well-laid plan and small details must not be overlooked. The men must be cautioned to remain almost immobile during the occupation of an ambush site.

"The next thing I have listed is a coordinated fire plan. Care must be taken to insure that every avenue of

escape is adequately covered and that maximum fire power can be delivered by all weapons at the critical period. Premature firing of a single weapon may result in the failure of the ambush and may even change the role of the attacker to that of defender or result in a complete rout. Good fields of fire must be well planned and well aimed. The fire plan must be so coordinated that the maximum killing effect is realized and the men must be impressed with the fact that their primary mission is to **kill** and not to capture.

"Next," Colonel Nesbit continued, "I think we should consider routes to and from the ambush area. The soundest plans may fail if routes of advance are not chosen with care. All means available must be employed in selecting a good route of approach. The route should, if possible, be concealed. It should be easily accessible and direct. In planning the withdrawal, alternate routes should be selected to avoid the possibility of enemy forces delaying the withdrawal of the ambush party. Selected routes should be patrolled periodically to insure that enemy infiltrators have not occupied them. Speed and breaking enemy contact are essential during the withdrawal because an ambush usually brings rapid and violent counteraction by the enemy.

"Another thing I feel is important, is actual rehearsals for the participating troops. Troops alerted to participate in an ambush operation should be rehearsed so well that they could perform their individual tasks almost instinctively when the actual occasion arrives. Each man should be instructed to go into the ambush

site, gather enemy documents and capture enemy personnel. In addition, they should know exactly how to handle the prisoners and what disposition is to be made of them."

In a concluding tone he said, "I think it is worth re-emphasizing that surprise is the one point which must **not** be overlooked. The efforts of days of planning and preparation will be wasted if this is neglected."

The Colonel smiled and scanned the peering faces that were seated around the table.

"Any comments?" he asked.

"Sounds good to me, Colonel," offered Clarke MacLaughlin.

"Some very good points, Jesse," remarked Blackmore.

"I say, Nesbitt," Harcourte said, "you shouldn't have any trouble teaching this subject but there is one thing you might add."

"Shoot," replied Nesbitt.

"In executing an ambush," Harcourte said, "I know that the utmost in control must prevail from the point of departure to the point of arrival at the ambush site. The most critical stage of the entire operation will be the moment the enemy arrives at the ambush site, at which time each man must be alert, and make certain that he does **not** open fire prematurely . . . an action that may result in failure of the planned ambush. Arm and hand signals, telephone communications, radio and pyrotechnics should be employed with care when the situation demands; and voice and other audible signals should be kept to the minimum.

"I might add," he continued, "some degree of consideration should be given to the suitability of the terrain to the type ambush proposed. To ambush vehicles, a position should be selected where the road passes through a defile, preferably one with steep banks or other obstacles which will prevent following vehicles from bypassing the wreck. One of the primary reasons for the vehicular ambush is to block the road with a mass of wreckage which will restrict or prevent the enemy from further use of the road. Don't forget, there should be plenty of natural camouflage for the entire ambush party. The ambush site should be defensible in order to prevent the enemy from over-running you before your mission is accomplished."

As the Brigadier paused, MacLaughlin remarked, "Along these lines, it might be worth mentioning that the type of ambush will dictate the special equipment needed. An ambush of personnel generally requires a huge percentage of automatic weapons, light mortars and fragmentation grenades, while one of a vehicular nature requires mines, projectile type weapons such as the rocket launcher, and incendiary devices which will immobilize and destroy vehicles."

"Very good," said Nesbitt—"These points will be welcome additions to my list."

"Say Jesse," interrupted Blackmore, "how about forgetting ambush for a few minutes and move our chairs to a better vantage point?"

"OK," agreed the Colonel.

"Your attention please, your attention please," . . . boomed the P.A. announcer. "Here are some final results: Burkemo defeated Cotton 3 and 2 with an eagle on the par five, 16th hole. Snead and Cameron are even."

As the announcer continued, Harcourte tapped MacLaughlin on the shoulder. He pointed off in the distance. "You know, Mac," said the Brigadier, "there's an interesting piece of terrain. I remember another time in Burma . . ."

Answers to problems on page 37.

(1) 3°
(2) 37°
(3) 318°
(4) 232°
(5) 5°
(6) 350°

. . . in war there are nothing but particular cases; everything there has an individual character; nothing ever repeats itself.

—Foch, De la conduite de la guerre

An Infantryman Speaks

the ideas of a great soldier live forever . . .

A good commander is a man of high character (this is the most important attribute), with the power of decision the next most important attribute. He must have moral backbone (this stems from high character) and he must be physically courageous or successfully conceal the fact that he is not. He must know the tools of his trade: tactics and logistics. He must be impartial. He must be calm under stress. He must reward promptly and punish justly. He must be accessible, human, humble, patient and forbearing. He should listen to advice, make his own decision, and carry it out with energy.

Unless a commander is human, he cannot understand the reactions of his men. If he is human, the pressure on him intensifies tremendously. The callous man has no mental struggle over jeopardizing the lives of 10,000 men; the human commander cannot avoid this struggle. It is constant and wearing, and yet necessary, for the men can sense the commander's difficulty. There are many ways in which he can show his interest in them and they respond, once they believe it is real. Then you get mutual confidence, the basis of real discipline.

The average **commander** envies the buck private; when things go wrong, the private can blame the **commander**, but the **commander** can blame only himself. The private carries the woes of one man; the **commander** carries the woes of all. He is conscious always of the responsibility on his shoulders, of the relatives of the men entrusted to him, and of their feelings. He must act so that he can face those fathers and mothers without shame or remorse. How can he do this? By constant care, by meticulous thought and preparation, by worry, by insistence on high standards in everything, by reward and punishment, by impartiality, by an example of calm and confidence. It all adds up to character.

GENERAL JOSEPH W. STILWELL
from: The Stilwell Papers

Lt. Col. Daniel B. Adams

THE new m48 tank

THERE EXISTS a style of writing on military developments that may one day become known as the "Gee-Whiz" approach.

It lacks the professional deftness of the advertising agencies, it soars well above the "Tech Manual" style and it falls somewhat short of the "Inter-Galaxy Space Ship" school. It implies, somehow, that all previous efforts along the development lines of its subjects are relegated to the "Horse and Buggy" days. Most importantly, it tells only an indefinite, proper fraction of the truth.

We will attempt to tread a fine line somewhere in the middle of these extremes, while we present the M-48 Tank and compare it to its ancestors and siblings. Like all good G.I. things, tanks bear a model designation . . . T-numbers while being tested and M-numbers after being accepted by action of the Ordnance Committee, Department of the Army.

Within the past few years, three tanks have been designed which bear a strong family relationship in design, similarity and profile. (See figure 1.)

These tanks are not designated as light, medium or heavy tanks, but are called: 76mm gun tanks, 90mm gun tanks and 120mm gun tanks. The line of separation between medium and heavy tanks is set at 50 tons . . . an arbitrary figure that is very nearly approached by the present 90mm gun tanks.

During the planned parenthood of the T-51, T-42 and T-43 series, the necessities of the "Cold War" intruded. We had finished World War II with the newly designed M-26 (a 90mm gun tank). Equipped with a 500 h.p. engine, this tank was somewhat under-powered. At the outbreak of the Korean hostilities, a sizeable number of the 90mm gun tank, M-46, were available. This later model (M-46 "Patton") has an 810 h.p., Continental V12 type engine with cross drive transmission.*

Its turret mounts a 90mm gun M3A1 and a coaxial caliber .30 MG while the tank commander's pedestal mounts a caliber .50 MG. A telescope and periscope are available to the gunner for firing but the tank commander has only a "Vane sight" . . . a somewhat crude device for laying the gun in direction. Power operation of the turret, in traverse only, is available to either the tank commander or gunner. Elevation is controlled by the gunner through mechanical operation of the elevating handwheel.

The M-46 fought well in Korea but in some difficult terrain it compared unfavorably with the 35 ton Sherman (the 76mm gun (M4A3E8) veteran of World War II). However, improved transmissions and oil cooling system in the M-46 decidedly reduced the number of mechanical failures.

During this time, a forced wedding was under way at the Detroit Tank Automotive Center. The hull of the M-46 was combined with the turret of the T-42 to produce the M-47. Not without appropriate labor pains, the M-47 came into being in quantity even while the M-48 was being produced.

Let us now compare the salient points of both M-47 and M-48. (See figure 2.)

If you remember, the T-42 turret is the predecessor of both the M-47 and the M-48 turrets. The departures here are the key to understanding the radical differences achieved.

Model	Gun	Weight	Purpose
T-41	76-mm	25 Tons	Use by Reconnaissance Units—Replace M-24
T-42	90-mm	38.5 Tons	The Medium class tank for Armored and Infantry Divisions
T-43	120-mm	58 Tons	Use by Heavy Tank Battalion, Armored Division and Corps Troops

Figure 1
This figure shows the gun-type, weight and purpose of the T-41, T-42 and T-43 Tanks.

* The dual bar steering of the M-4 was replaced by a "wobble stick."

	End of WW II to "Cold War"	Korean Hostilities	Post-Korea
Light Gun Tanks	75-mm Gun Tank M-24 ⟶	76-mm Gun Tank T-41 ⟶	M-41
76-mm Gun Tank M4A3E8	⟶		
Medium Gun Tanks		90-mm Gun Tank M-46 plus T-42 = M-47 ⟶	M-48
90-mm Gun Tanks	M-26 ⟶ M-46		
Heavy Gun Tanks	(T-32) ⟶	120-mm Gun Tank T-43 ⟶	(M-43?) Future

Figure 2

This figure shows the evolution of our present day tanks.

Hydraulic Operation of M-47 and M-48 Turret. For the first time, both the tank commander and the gunner can point, track moving targets and fire the main armament using a pistol-grip. The power elevation control operates an electric-hydraulic system that lifts the big gun or depresses it, while the same grip affords concurrent traverse. Full or "slew" speed will rotate the turret about 4 RPM in the M-47 and 6 RPM in the M-48.

Optical Sight for the Tank Commander. To use the power controls described intelligently, there was provided an optical sight. With this sight, the tank commander can identify and lay the gun on the target of his choice, eliminating the directional element of the fire command and minimizing doubt on the target description element.

The 90-mm Gun. The M-3 gun found in the M-26 and M-46 tanks is derived from the antiaircraft 90mm gun, adopted with an appropriate mount and dual hydro-spring recoil system.

The M-36 gun of the M-47 tank and the M-41 gun of the M-48 are designed primarily for each particular tank. An improved mount and recoil system has been provided. It is no longer the dual type but is concentric—i.e., the gun tube moves concentrically in the mount during recoil and counter-recoil.

The muzzle brake on the M-46 tank gun has been replaced by a "blast deflector" or "dissipator" in both the M-47 and M-48 tanks. It has substantially reduced the obscuration of vision for both tank commander and gunner during firing.

The "bore evacuator" is an ingenious device found on the guns of all three (M-46, M-47 and M-48) tanks. It consists of a cylindrical sleeve on the barrel near the muzzle, with eight forward slanting holes drilled through the gun tube. Each time a projectile leaves the tube, a pressure difference is formed which draws the fumes forward and out the muzzle. This eliminates the build up of nauseous fumes in the turret as a result of continuous firing.

Though all of these guns are of the vertical sliding breechblock type, the outstanding difference in the tank guns of both M-47 and M-48 tanks lies in the chamber and the new ammunition cartridge case used with it.

The conventional types of ammunition used with the M-26 and M-46 tanks can be fired in the M-47 and M-48, but the reverse is not true. Ammunition designed for the new tanks can **not** be used with the M-26 or M-46.

In the new M-48 tank, the "quick change" gun tube is a new feature. The tube may be removed from the breech ring by unscrewing a socket head cap screw on the top front of the breechblock recess and removing a tube lock key. With the tube supported, it may be unscrewed from the breech ring.

The well trained crews at Aberdeen have removed and replaced the tube and traversed the tank turret back to fire on target in 15 minutes with no loss in accuracy. The advantage in this method is in field maintenance. Previously, it was an Ordnance Shop job to remove the tank gun for service, as was done for recoil cylinder leaks.

The Turret Shape and Armor Protector. Recently, a student at The Infantry School asked the question, "How many times can you rotate the turret?" The reply was, "Well, it's not a piano stool . . . you can

The new 90mm gun tank, M-48.

Tank Climbs 60% slope during rigorous test.

rotate it all day if you want to get a cheap drunk."

The radius of the turret ring is a critical design feature. The floor space of the turret basket depends upon this dimension. The elbow room for loader, gunner and tank commander depend upon the turret shape.

In the M-47 tank, added armor protection of the turret front was obtained, by laying back the vertical 4 inches of armor, giving the equivalent protection or "armor" basis of 6 inches! The M-48 was a direct result of a design study to obtain maximum obliquity of armor.*

As we "refuse" the armor to achieve better protection, we diminish the crew space and, consequently, can regain crew space in the turret only by increasing the diameter of the turret ring.

The cast armor steel turret rotates on ball bearings in a turret race ring attached to the top of the hull. The weight of a gun is counter-balanced by a bulge at the rear of the turret which houses the tank radio equipment.

In the M-48 tank, we have substantial increase in crew space and a nearly hemispherical turret with increased armor. The equivalent pro-

* For a discussion of armor basis and projectile effect, see The Infantry School Quarterly, July 1950, "Guns Against Armor" by Capt. Robert N. Ives.

Hull Armor	M-46	M-47	M-48
Front Upper	4" @ 46°	4" @ 60°	4¾" @ 60°
Front Lower	3" @ 53°	3½-3" @ 53°	4" @ 53°
Sides—Front	3" @ 0°	3" @ 0°	3" @ Compound Angle
Sides—Rear	2" @ 0°	2" @ 0°	2" @ Compound Angle
Top	1"	⅞"	2½"
Floor	1" to ½"	1" to ½"	2½" to ½"
Rear	2" @ 10°	2" @ 10°	1⅜" @ 30°

General Characteristics	M-46	M-47	M-48
TOTAL WEIGHT (Combat Loaded)	48.5 Tons	48.6 Tons	49.5 Tons
Width	11.5 ft.	11.5 ft.	12.2 ft.
Length (Gun Rearward)	23.1 ft.	23.2 ft.	24.2 ft.
Height (w/o MG)	9.3 ft.	9.7 ft.	10.6 ft.
Ammunition Stowage (90-mm)	70 rds.	71 rds.	60 rds.

Figure 3
Here, is shown the armor distribution on the three types, as well as overall characteristics of the complete tank.

tection is 7 inches on the turret front, 3 inches on the side, 2 inches on the rear and 1 inch on top. The increase is only in the front, where most AT missiles are expected to strike.

The Hull and Engine Compartment. The trend in armor protection is toward increased frontal armor. As we progress from front to rear, armor decreases. The floor is designed to protect against normal mine action and the deck protects only against air bursts, as does the turret top. (See figure 3.)

Automotive Aspects. A great standardization from an Ordnance training and supply point of view, is achieved by using the same engine, transmission and accessories on several models. The same power plant used in the "Patton" 48 is used in at least five other combat vehicles, including M-46 and M-47 tanks. However, the M-48 driver's compartment has numerous features worthy of mention. With the gun directly forward, the driver's hatch is right below the gun, with little clearance for a big man to get in and out. In an emergency, however, he can pull a red lever at his left and be literally dumped out through an escape hatch in the bottom. It is not like the pilot-ejection seat of the modern jet fighter, but more like the carnival attraction where the bathing beauty is dropped from her perch with a well aimed baseball.

The cross country performance of the M-48 tanks is generally identical to the M-47 and M-46. The gasoline capacity has been reduced from 233

gallons to 200 gallons. Consumption, at an average of 1/3 miles per gallon, reduces the range from 80 miles on the M-47 to about 70 miles on the M-48. Both models should climb a 60 percent slope, span an 8½ foot antitank ditch, climb a 3 foot vertical obstacle and ford through 4 feet of water over a firm bottom. The driver has a steering wheel instead of a wobble stick which is similar in appearance to that on an aircraft.

The tachometer has been eliminated and a red warning light operates below 800 RPM. In shutting off the engine after a prolonged march, the driver must take about five minutes to throttle down and de-gas before cutting the engine; otherwise, a flashback of undesirable magnitude will probably occur.

The driver, as on previous models, controls all electrically operated devices through the master relay switch. He has, at hand, controls for the main engine, auxiliary generator, heater, fire extinguisher system and lights.

Firepower and Gunnery Methods. An appreciation of the main armament, the 90mm gun, combined with its secondary armament, the machine guns, is necessary for a full understanding of the tank's firepower. In the Infantry support and antitank role, the 90mm gun is dominant. However, the tank's mission in the attack is to close with the enemy and fire upon disorganized troops. The tank's machine guns are the most effective means of doing this, summed up in the phrase . . . "mobility, shock action, firepower."

This leads us to consider the tank armament as primarily direct fire weapons. It **may** be used in the artillery role but two deterrents are present:

1. The use of the 90mm gun in the artillery or indirect fire role leads to a lack of aggressive use of the tank's shock action and mobility.

2. The ammunition is all of high velocity types and its use as an artillery piece accelerates wear on the gun tube.

This does not indicate that the training of tank crews be limited to direct fire. It is necessary when firing at night, in fog or poor visibility

Weapon	Tank Model		
	M-46	M-47	M-48
90-mm Gun	M3A1	M-36	M-41
Coaxial MG	Cal. .30 1919A4	Cal. .30 M1919A4 or Cal. .50 M2E1	Cal. .30 M1919A4
Bow MG	Cal. .30 M1919A4	Cal. .30 M1919A4	None
Ground AA MG	Cal. .50 M2	Cal. .50 M2	Cal. .50 M2
Individual Wpns.	Pistol Cal. .45 1-SMG, M3A1, Cal. .45	Same	Same

Figure 4

This armament tabulation shows the available weapons of the M-46, M-47 and M-48 Tanks.

Cross country operation. Note driver's position and hatch cover directly below gun.

to employ indirect methods in what has become known as "additional methods of fire."

Let us consider the gunnery materiel, consisting of armament, ammunition, fire control equipment and the all important human element. (See figure 4.)

Note that the M-48 has a loss in firepower caused by the removal of the bow machine gun. The original design contemplated the use of two coaxial machine guns—one Cal. .50 and one Cal. .30 on either side of the main armament. However, the space for the right machine gun is occupied by the gunner's telescope.

The elimination of the bow gun naturally led to elimination of the bow gunner.

The M-48 tank crew consists of a tank commander, gunner, loader and driver. All of these must be present, fit for duty and at their station if the tank is to operate tactically.

The T/O&E spaces vacated by the bow gunner will probably not be saved in their entirety. A current solution under consideration is to retain these men in the company as immediate replacements and to assist in crew maintenance.

It is not within the scope of this article to present in detail the am-

munition types available to the 90mm gun. The types used with the M-46 tank are high explosive, white phosphorous, armor piercing or armor piercing capped and hyper shot. They are still good in either the M-47 or M-48 tank. The new types, under development for the M-47 or M-48 tank guns exclusively, will all be equipped with tracers. The common characteristic is high muzzle velocity and long range. For example, the high explosive round M-71 has a muzzle velocity of 2700 ft/sec and a maximum range of 11.1 miles. The 24 pound projectile has an extremely flat trajectory, rising only 40 yards when fired at a range of 4000 yards, with a vertical probable error of only 4.3 feet.

This characteristic is cited principally to introduce us to a consideration of the fire control equipment. If the gun and ammunition can reach out accurately to greater ranges than other weapons of the Infantry regiment, it follows that the greatest need is to provide highly accurate fire control equipment to reduce the inaccuracies of the human element, particularly in range estimation at greater distances. This is especially true when the first round may prove decisive.

Tank at about four feet depth in fording test.

TRUE RANGE	PERMISSIBLE DEVIATION—3 TO 4 U.O.E.	
	M-47 Tank M-12 Range Finder	M-48 Tank T46E1 Range Finder
(Yards)	(Yards)	(Yards)
1000	14 - 19	8 - 11
1500	31 - 42	18 - 24
2000	56 - 74	32 - 42
2500	87 - 116	50 - 66
3000	126 - 167	72 - 95
3500	171 - 228	97 - 130
4000	223 - 298	127 - 170
4500	283 - 377	161 - 215

Figure 5

This figure is based on allowable deviations of 3 to 4 Units of Error (3 UOE = 14 yards per thousand per thousand, M-47 Tank, and 8 yards per thousand per thousand, M-48 Tank).

A range finder, which is also the gunner's primary sight, first appeared in the M-47 tank. In the M-48 tank, the range finder is operated by the tank commander, who transmits its data to the gunner's periscope.

Both instruments operate on the stereoscopic principle, which requires good vision and particularly good depth perception. In both tanks, the operator turns a range knob until he perceives a ranging reticle at the same apparent distance as the target. This is the "ranging" operation known as "stereocontact."

Given the same precision of manufacture, this type range finder will have its accuracy dependent on 2 factors . . . the "base" or distance between the 2 lenses projecting out both sides of the turret and the degree of magnification provided.

In the M-47 tank, the Range Finder M-12 has a 60" base and 7.5 x magnification. In the M-48 tank, the Range Finder T46E1 has a 79" base and 10 x magnification. The difference is only significant when we understand that whatever error or deviation is obtained by the M-47 tank gunner, only 57% of that deviation should be present when that gunner becomes tank commander on an M-48.

The amount of deviation necessary in judging the consistency of results in training and in the administration of the Gunnery Qualification Course is outlined in par. 9 and 20, T.C. 36, 29 Dec. 52.

It is not possible to use a simple per cent of range as a tolerance. Rather, it may be expressed in deviation of range multiplied by range . . . both range figures in thousands of yards and called "units of error." (See figure 5.)

For qualification at random field targets, it is necessary to survey the area very accurately. Tankers should be able to do this with an aiming circle. Also, it may be a good exercise for their associates in the survey parties of heavy mortar company or artillery units.

The essence of training is to

clearly set forth the adjustments made **before** a fire mission starts. These include: bore-sighting; emergency zero settings which compensate for jump; optical settings, as with a pair of binoculars and the I.C.S. setting.*

Much of the trouble experienced by soldiers not familiar with these sights is caused by their attempt to look at the "close up" of the reticle. If they will simply focus their eyes on the target, many initial difficulties will be eliminated. The range finder is a dual purpose instrument. Besides its ranging function, it is also a gun sight.

In the M-46 and earlier tank models, sight reticles provided a bore sight cross corresponding to the optical center of the instrument. Below it was a series of dashes and spaces, representing increments of range. To compensate for the fall of the projectile in flight, the gunner's sight picture off-set elevation by selecting the proper range dash as an aiming point.

In the range finders and periscopes of the M-47 and M-48 tanks, a **single** aiming point—the boresight cross—is used for the **initial round at all stationary targets, regardless of range and type of ammunition used.**

This is done by building into a gear box what is actually a "mechanical firing table." It is, essentially, a series of non-circular gears, whose differential output causes the sight reticle to depress as range increases. The depression is an angle in mils exactly equal to the angle of elevation needed for that particular range and ammunition type called "super-elevation."

The operator indexes the ammunition type to be used, turns the range knob for "stereo contact" and experiences depression of the reticle as range increases or ammunition velocity and mass decreases. The sight and gun are linked together. In order to restore the proper sight picture with the "center of mass" of the target silhouetted against the bore sight cross he elevates the gun. By doing this, the correct super-elevation for that range and ammunition combination are automatically applied.

The nomenclature used to describe this function varies among models. The above description applies specifically to manual operation of the M-47 turret, using the M-12 range finder in manual operation or the M-20 periscope, with ballistic drive T23. In the M-48 tank-phase III, the same function is performed by the "range drive unit T25" for the periscope M-20.

When the M-48—phase IV is available, the computer T-30 will replace the range drive T25. It will link both the range finder T46E1 and the periscope M-20, into simultaneous operation. (See Figure 7.)

The M-48 gunner's secondary sight, the telescope T156E1, is graduated for only one ammunition type—the new AP-T "SHOT." For other ammunition types, the range drive unit is consulted for the equivalent aiming point.

Though the instruments described allow for a very high probability of a first round hit, the similar reticle patterns afford a rapid method of adjustment in the event of a missed first round.

* A full treatment of these procedures is set forth in Training Circular #21, 6 Oct 53 for the M-48 tank, and in T.C. 36, 29 December 52, as changed by T.C. #18, 8 September 1953 for the M-47.

The "burst-on-target" technique is applied without command when the first round misses. The gunner notes on his reticle pattern that point at which the burst occurred and uses that point of the gun laying reticle as his new aiming point by moving the gun. It is a refinement of the "Kentucky Windage" method, possible because the reference lines of the reticle pattern are symmetrically placed to facilitate this method.

With armor piercing rounds, the tracer path at target range is adjusted—since there is no burst. It works as well against moving targets. (See figures 8 and 9.)

Prior to firing at night or in rain and fog, tank commanders prepare range cards in similar fashion to machine gun squads. In defensive positions or in prolonged halts in the offensive, the range cards are prepared (anticipating likely targets or target areas).

The quadrant elevation is determined by laying the tank gun as in direct fire. The quadrant elevation in mils is read from either of two quadrants available. For direction, an "azimuth indicator" is employed in conjunction with an aiming stake. The azimuth indicator records in mils

LT. COL. DANIEL B. ADAMS is especially qualified to write about tanks. He is a man well acquainted with the species, having studied both friendly and belligerent ones . . . at close range. In WW II, he led an antitank company into combat in Tunisia. At present, the author is chairman of the Tank Weapons Committee at The Infantry School.

	M47	M48	
		Phase III	Phase IV
Tank Commander's Sight	Periscope M20	Range Finder T46 E1	Range Finder T46 E1
Gunner's Primary Sight	Range Finder M12	Periscope M20	Periscope M20
Super-Elevation Transmitted by action of	Super Elevation Transmitter T13 (for Ranging in Power Operation)	Range Drive T25 (to Periscope)	Computer T30 (To Periscope and RF T46)
	Ballistic Drive Unit T23E (for both Periscopes)	Ballistic Drive Unit T24E1 (for Gunner's Periscope)	Ballistic Drive Unit T24E2 (for Gunner's Periscope)
Gunner's Secondary Sight	Periscope M20	Telescope T156E1	Telescope T156E1

Figure 7
This figure indicates the progressive change in direct fire control sights and associated equipment.

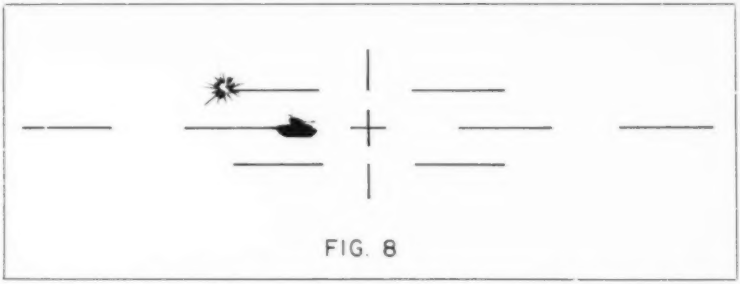


FIG. 8

Initial sight picture (shot, moving target). Gunner applies one lead, fires first round, and observes tracer in sight reticle as it passes the target.

any rotation of the turret from its zeroed position alined on the aiming stake. Using conventional means to illuminate the aiming stake at night, the tanker may then lay the gun for both elevation and direction from the accumulated data on his range card. The results to be expected are somewhat less accurate than in direct fire but not to an unacceptable extent (depending on the ability of the crew to use their equipment accurately).

The gunner's quadrant M1 has also proved its worth in Korea in direct fire against bunkers. Called "precision adjustment," small vertical impact changes may be made by use of the firing tables in conjunction with the quadrant. For example, at 3000 yards range, an elevation change of 1 mil when firing at a vertical target, will cause impact of the HE shell to move 100 yards in horizontal range and 9 feet in vertical range. Since the gunner's quadrant is graduate to 0.2 mils, finer adjustments are possible and are limited only by the "vertical probable error," which is only 2.6 feet at this range of 3000 yards.

Having presented this capability, borne out by Korean experience, we

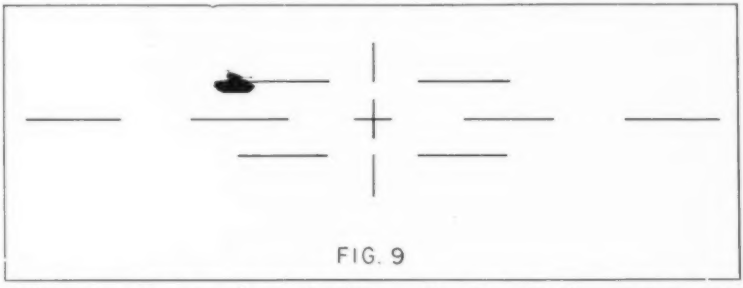


FIG. 9

Sight picture for second round (shot, moving target). Gunner lays point on reticle where he observed tracer on center of target by moving the gun.

hasten to state that the tank should not be considered solely as a mobile gun platform. In a sense, the main gun on the tank is used to clear the way for the machine guns to fire on enemy troops. The versatility of the tank is not confined to the purpose of tank duels, although this subject is of sufficient interest to warrant the reader's attention.

The M-48, by virtue of its heavier frontal armor and rounded shapes, has the protection to "slug it out." It has the fire power for the Infantry support role and the attack. It can knock out enemy pill boxes and opposing tanks which threaten our riflemen.

The new M-48 tank will add greatly to the Infantry regiment's fire power and will provide it with a deadly mobile shock-action.

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For complete detailed discussion check the reference listed with each of the answers below.

1. d. (to facilitate interrogation) (FM 21-75 (October 1950) par 136a).
2. Screening, incendiary and casualty effects against enemy personnel (FM 23-30, par 12).
3. c. (FM 23-85, par 139c, e(1)).
4. c. (FM 23-5, Oct 1951, par 121b).
5. d. (FM 7-20, par 364).
6. c. (FM 21-5, par 102f and j).
7. High Explosive, High Explosive Antitank, High Explosive Plastic and White Phosphorous. (DA TC 31, par 41-44).
8. General support of the battalion. This platoon has a high degree of mobility and is capable of moving quickly from one portion of the battalion zone to the other to meet an unexpected tank threat. In exceptional cases, when a company has a particularly dangerous avenue of tank approach, when a company is operating beyond reinforcing distance of the battalion or when an obstacle exists that prohibits rapid movement of the recoilless rifles from one portion of the battalion zone to another, a section may be attached to a rifle company.

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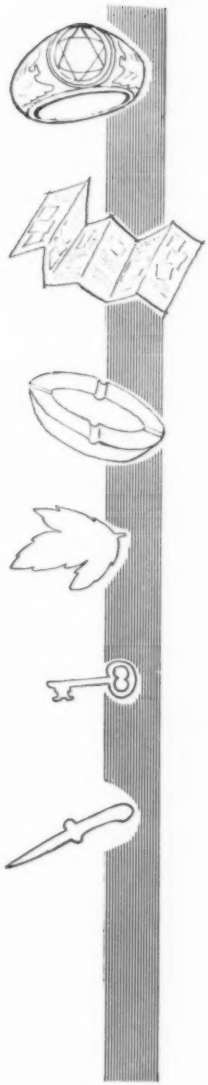

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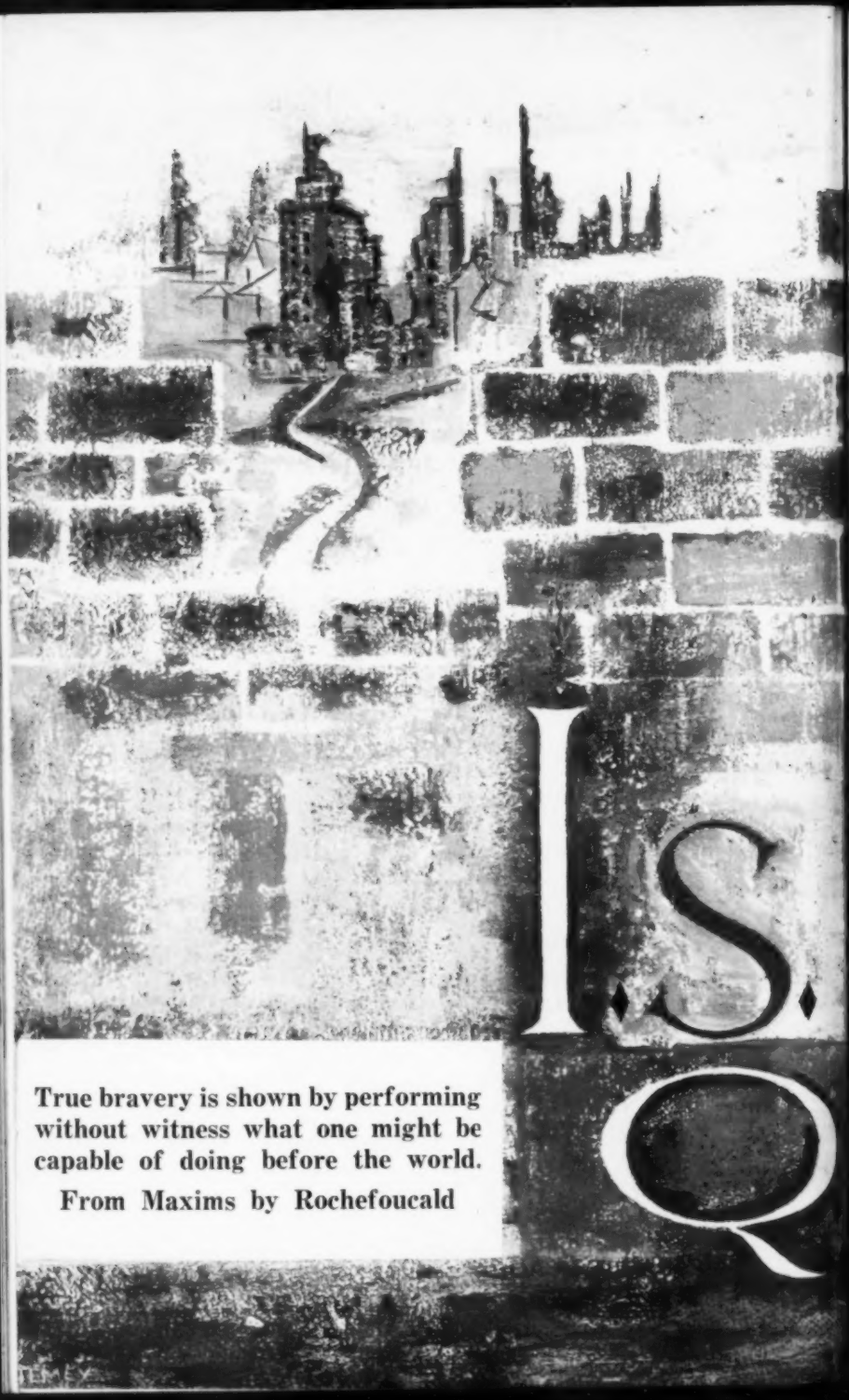

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